

JurisAI– Your Legal AI Assistant

Mohammad Afzal Khan¹, Shrikant Pawar², Vedanth Choudhary³, Mrs. Suwarna Thakre⁴

Students, Department of Information Technology^{1,2,3}

HOD, Department of Information Technology⁴

Thakur Polytechnic, Mumbai, India

afzalk280306@gmail.com, pshrikanwork@hotmail.com,

vedanthpc42@gmail.com, suwarna.it@tpoly.in

Abstract: India's law enforcement and legal documents have been plagued with inefficiency, inaccuracy, and delays for a long time, especially while preparing First Information Reports (FIRs). Legal intricacies tend to give rise to misconceptions, flawed application of law, and procedural hold-ups. To mitigate this, JurisAI presents a solution that relies on AI, which aims to make the preparation of FIRs more efficient. This app takes advantage of state-of-the-art natural language processing (NLP) and machine learning algorithms to scan case information and suggest related legal sections and acts, which minimizes the scope for errors and speeds up case registration. JurisAI also offers functions like speech-to-text input, AI-driven suggestions for legal sections, and user-selectable FIR templates, so it is of use to the police officer, legal expert, and citizen in general. By augmenting accuracy, efficiency, and legal adherence, this application greatly enhances the overall justice delivery process. In this research paper, we analyze the advantages, extent, and influence of JurisAI in revolutionizing legal paperwork.

Keywords: Artificial Intelligence, FIR Automation, Legal Adherence, NLP, Case Law, Law Enforcement, Speech-to-Text

I. INTRODUCTION

Legal documentation and law enforcement in India face multiple challenges, particularly in maintaining accuracy and efficiency in the registration of First Information Reports (FIRs). Police officials and legal experts frequently get bogged down by the intricacy of legal clauses, resulting in mistakes and time wastage in registering cases. The conventional method of preparing FIRs takes time, with manual checks on the applicable legal sections and acts being carried out. This not only slows down the pace of justice but also impacts the overall effectiveness of law enforcement agencies.

JurisAI solves these problems by providing an AI-based solution that simplifies the process of drafting FIRs. The app uses natural language processing (NLP) and machine learning to scan case information and recommend relevant legal sections, minimizing the scope for human error. With functionalities like speech-to-text input, AI-powered legal suggestions, and FIR template customization, JurisAI facilitates fast and accurate reporting. It also reduces reliance on legal knowledge for first-time case filing, making it a must-have for police officers, attorneys, and even citizens. By incorporating AI-based legal support, JurisAI facilitates legal compliance, accelerates case registration, and ultimately leads to a more streamlined justice system.

1.1 Overview

Legal inefficiencies and inaccuracies in the submission of First Information Reports (FIRs) have been a perennial challenge in India. Legal reports indicate delays in submitting FIRs and misidentification of legal sections as being responsible for backlogs of cases, extended investigations, and misapplication of the law. Lack of technological intervention in legal records causes errors that could affect the judicial process.

- A research on inefficiencies in legal systems points out that almost 30% of FIRs have flaws because of inappropriate legal sections, causing trials and case cancellations to be delayed.



- Also, more than 60% of police personnel report wasting time in checking legal provisions while preparing FIRs, lowering their productivity in case management

JurisAI is looking to revolutionize this process with AI-based legal support. Through the use of Natural Language Processing (NLP) and machine learning algorithms, it guarantees precision in FIR drafting by proposing the appropriate legal sections and acts. Speech-to-text input, real-time legal suggestions, and editable FIR templates make it easy for law enforcement agencies and citizens to simplify case reporting.

CASES PENDING IN HIGH COURTS		ALL INDIA: 59,57,454	
High Court	Pending cases*	High Court	Pending cases*
Allahabad	10,26,417	Telangana	2,58,932
Rajasthan	6,05,215	Patna	2,20,403
Bombay	5,92,583	Andhra Pradesh	2,35,482
Madras	5,63,595	Calcutta	2,15,859
Punjab & Haryana	4,50,527	Odisha	1,85,567
Madhya Pradesh	4,17,003	Gujarat	1,58,512
Karnataka	2,96,965	Delhi	1,05,814

*As of July 22, 2022

Fig.1-Statistics on delay in filing FIR leading to pending cases.

As the legal ecosystems increasingly digitize, AI-enabled legal solutions such as JurisAI can streamline legal compliance, boost efficiency, and facilitate quick delivery of justice.

Some shocking data:

- As per reports of the legal fraternity, close to 30% of FIRs are filled with errors as a result of improper legal sections, causing delays and dismissals of cases.
- More than 60% of police officers admit to wasting too much time checking legal provisions while preparing FIRs, lowering their productivity in case handling. According to a BBC investigation from February 2013, about 7,200 children are assaulted in India each year.
- As many as 40% of FIRs are manually corrected to rectify errors in legal sections, adding to the administrative workload of law enforcement agencies..
- The time spent to manually file an FIR can be anywhere between 30 minutes and several hours based on the complexity of the cases and the workload of the officers.
- Complainants' ignorance of the law leads to cases being misfiled or to the exclusion of important legal segments, impacting investigation outcomes.
- Over 50% of citizens remain ignorant of the correct legal provisions while filing a complaint, raising the reliance on legal experts.
- The time lag involved in FIR registration tends to cause legal loopholes, diluting the case and lowering conviction rates.
- Artificial Intelligence (AI)-aided FIR registration has the capability of lowering errors by 70% with accuracy and legal adherence.
- JurisAI's speech-to-text functionality enables officers to verbally dictate FIRs, cutting filing time by more than 50% and boosting efficiency.
- By streamlining legal section recommendations, JurisAI reduces the demand for manual checks and allows officers to concentrate on investigations instead of paperwork.
- Computerized FIR systems backed by AI can also greatly improve case monitoring, legal compliance, and report accuracy.
- JurisAI hopes to transform the process of legal documentation to register cases faster, more accurately, and legally.



1.2 Purpose

JurisAI is mainly designed to offer an intelligent and effective solution to automate the process of drafting the FIR through the use of Artificial Intelligence (AI) and Natural Language Processing (NLP). Filing an FIR is either postponed or completed inaccurately because of ignorance about laws, human errors, and complex laws. These inefficiencies cause misreporting and delay in justice.

Provide an AI-driven system that aids in the preparation of FIRs by examining case information and suggesting the appropriate legal sections automatically.

1.3 Significance

We are keen on solving the difficulties for law enforcement officials and citizens in submitting correct and prompt First Information Reports (FIRs). Manually searching for the right legal sections is a laborious and error-prone task, which slows down justice. JurisAI makes sure that legal services provided by AI make this process more efficient and quicker. There have been a number of cases where erroneous FIR filings have resulted in delays in legal proceedings. In India, where the legal system is afflicted with backlogs and inefficiencies, an AI-based solution like JurisAI is needed to automate law enforcement procedures. The justice system must evolve to incorporate automation and AI-based solutions to deliver fairness, transparency, and efficiency in legal documentation. A cut-and-dried solution must be implemented to make legal documentation contemporary—JurisAI.

1.4 Objective

- Streamline FIR writing process by incorporating law section recommendations provided by artificial intelligence to prevent human errors.
- Provide speech-to-text input to enable easy filing of complaints, thereby making it universally accessible.
- Provide timely legal updates for compliance of FIR filing with current legislation and amendments.
- Develop an intelligent system that compares case data and suggests the most suitable legal sections.
- Make it easy for police officials and lawyers to file FIRs without having to conduct lengthy legal research.
- Utilize low-cost AI technology to make automation of police FIR registration possible.

II. PLATFORM AND TECHNOLOGY USED

2.1 Web Frameworks:

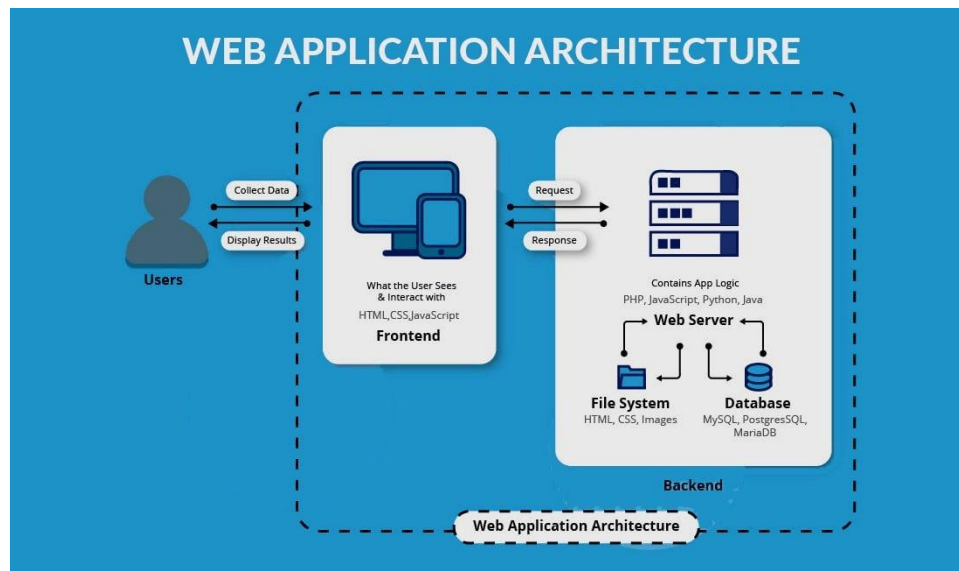


Fig.2—Web Application Architecture



The **JurisAI** system is built using a robust and scalable technology stack that ensures efficient performance, seamless integration, and high security. The system architecture consists of three main components: **Front-end, Back-end, and Database**, each playing a crucial role in delivering a user-friendly and responsive experience.

1. Front-end

The front-end of JurisAI is developed using HTML5, CSS3, and JavaScript, which provide a responsive and interactive user interface. These technologies enable smooth rendering of web pages, dynamic content updates, and cross-platform compatibility for a seamless user experience.

2. Back-end

The back-end of JurisAI is powered by Python and the Flask web framework. Flask provides a lightweight and flexible environment for developing web applications and APIs. The back-end is responsible for handling requests, processing data, and interacting with the database. Several Python libraries are used to enhance the back-end capabilities, including:

- os – Handles file and directory operations.
- logging – Implements logging mechanisms for debugging and error tracking.
- requests – Enables HTTP requests for API interactions.
- langchain_huggingface (HuggingFaceEmbeddings) – Facilitates NLP-based embeddings for text analysis.
- langchain_chroma (Chroma) – Manages vector databases for efficient data retrieval.
- langchain_community.document_loaders (PyPDFLoader, DirectoryLoader) – Enables document loading for AI-powered legal document processing.
- langchain.text_splitter (RecursiveCharacterTextSplitter) – Splits textual data into manageable segments for processing.
- flask (Flask, request, jsonify, render_template) – Core framework for handling web requests and rendering templates.
- flask_cors (CORS) – Allows cross-origin resource sharing for web-based API interactions.

3. Database

To ensure efficient data storage and retrieval, JurisAI employs a combination of NoSQL and SQL databases:

- MongoDB – A NoSQL database used for handling unstructured legal data and document storage.
- Firebase – Provides real-time database capabilities for dynamic updates.
- PostgreSQL – A relational database used for structured data storage, ensuring integrity and consistency in legal records.

The combination of these technologies ensures that JurisAI is a scalable, reliable, and high-performance system designed to handle complex legal queries, document analysis, and AI-powered insights efficiently.



database operations. Python has become extremely popular because of its flexibility, especially in areas like machine learning, data analysis, and web development, where libraries like TensorFlow, Pandas, and Django are used extensively. Python 2 and Python 3 were the two principal versions, but Python 2 was retired in 2020, and Python 3 is the standard now. Python's compatibility with other languages like C, C++, and Java makes it a favorite for creating scalable and efficient applications.

2.4 MongoDB Database

MongoDB is a NoSQL database that operates in the background, providing a schema-less, document-oriented database engine with high scalability. It is a zero-configuration database, meaning that, unlike relational databases, you do not need to define a strict schema before using it. MongoDB runs as a stand-alone process or as part of a distributed cluster, offering flexibility based on application requirements. Instead of tables and rows, MongoDB stores data in JSON-like BSON documents, allowing for dynamic and flexible data storage. MongoDB supports drivers for a wide range of programming languages, making it a versatile choice for developers. It provides strong consistency but follows an eventual consistency model in distributed systems for performance optimization. MongoDB includes an automated testing framework to ensure stability across versions, with rigorous validation before each release. Since its launch, MongoDB has focused on enhancing scalability, performance, and security.

MongoDB is lightweight and efficient, with a modular architecture that allows customization based on application needs. It is self-contained and does not require an extensive setup, making it easy to deploy. MongoDB ensures ACID-compliant transactions in its latest versions, allowing secure multi-document operations. Developed in C++, MongoDB features a powerful and flexible query language. It includes a built-in shell interface for database management, enabling users to create collections, define indexes, insert and modify documents, execute queries, and manage clusters efficiently. It also serves as a model for developing modern, high-performance applications.

III. LITERATURE REVIEW

As discussed earlier, inefficiency and inaccuracy in FIR filings have been a constant feature in India. Despite the development in digital infrastructure and AI enhancing several aspects, the police are still plagued with outdated, manual procedures, which lead to delays and inaccuracy in case registration. An NCRB report shows that nearly 30% of the FIRs are incorrect, impacting case verdicts. Over 60% of police officers also complain of wasting excessive time verifying legal provisions, reducing their efficiency in investigations.

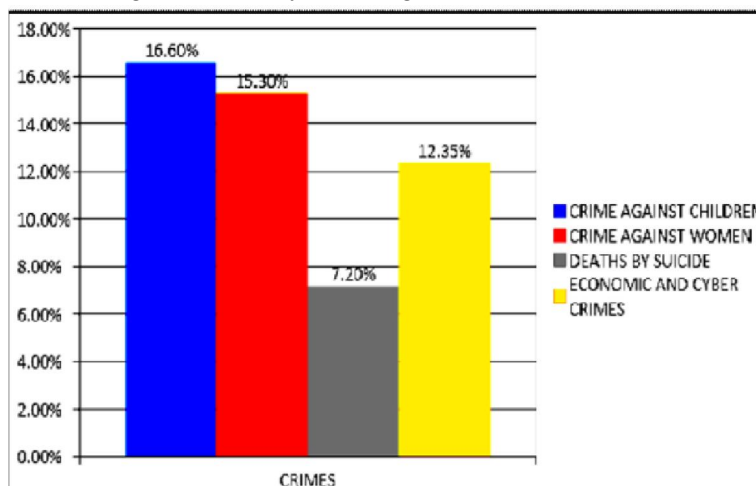


Fig.5–NCRB's Crime Report

During the process of developing this project, we encountered several issues related to legal documentation and enforcement in India, where we realized the necessity for technological intervention. Government reports and legal studies highlight the increasing pendency of cases, with millions of unresolved cases pending in courts because of



inefficient filing processes. Though AI-based solutions have been adopted in various fields, the justice system is still manual-based, resulting in more delays and misreporting.

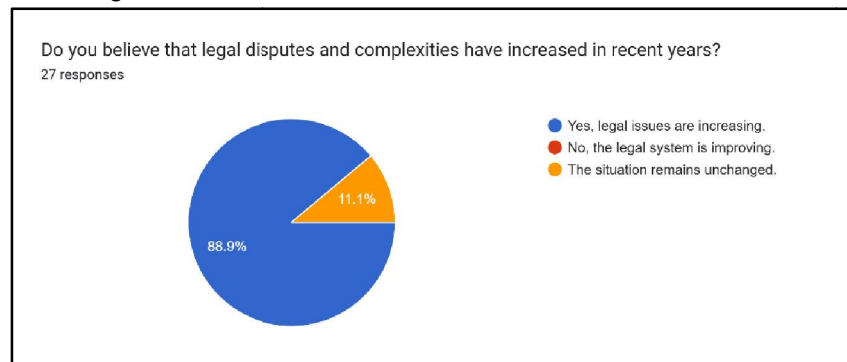
With the increase in digital governance and AI-based automation, it is important to bring AI-based legal aid to prevent errors and ensure efficiency in filing FIRs. In a developing nation like India, where the judicial system is overwhelmed with millions of pending cases, these inefficiencies are daunting. The application of JurisAI is a much-needed technology to improve the justice system, eliminate errors, and make legal processes more efficient.

The above graph clearly shows trends of crime in India, with increasing trends of crimes against children (16.60%), crimes against women (15.30%), economic and cyber crimes (12.35%), and suicide deaths (7.20%). The crime rate against women is increasing, which is reflective of a societal and legal lacuna in ensuring their security. With the increasing literacy rates of women and their participation in the urban workforce, the high rate of gender-based crimes questions the efficiency of law enforcement and the public safety measures.

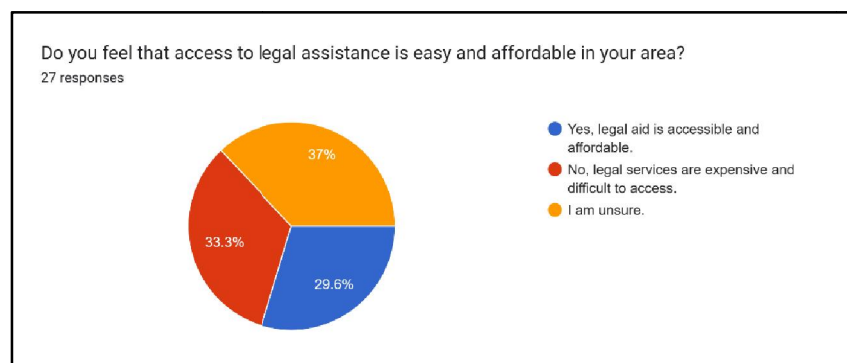
A project like JurisAI can automate legal processes, increase access to justice, and provide accuracy in case filing. With millions of cases pending in the judiciary, the adaptability of AI-based legal services can go a long way in cutting down delays, increasing accuracy, and providing legal transparency. A nation that still grapples with inefficiency in the system and increasing crime rates needs a system that is upgraded—something that leverages AI to revolutionize the legal sector and increase the efficiency of the Indian justice system.

III. GOOGLE SURVEY

We conducted a survey across 27 people belonging to different age groups using google forms, and here is the statistical data that we collected through it.

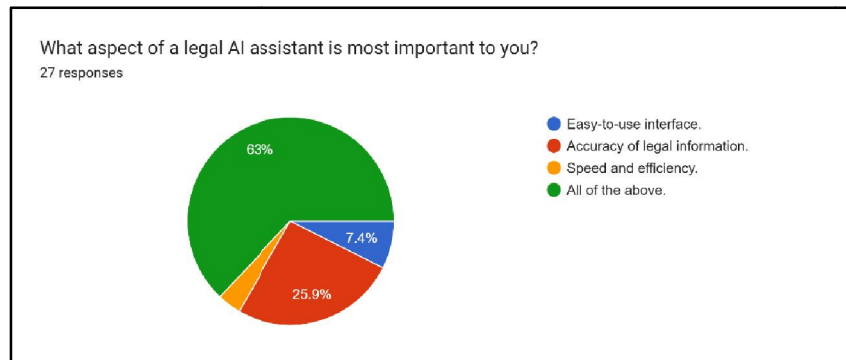


88.9% of the users concurred that legal matters and conflicts have been on the rise in recent years. The remaining 11.1% of users think that the scenario is the same, i.e., legal complexities are increasing but some still view it to be constant over time.

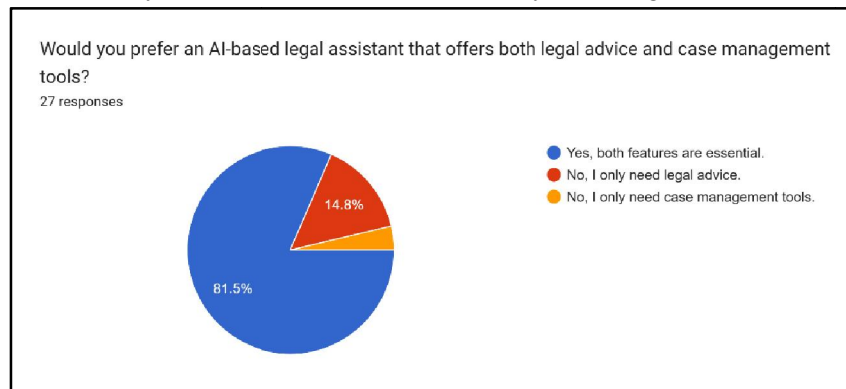


33.3% of the users replied that legal service is costly and hard to obtain, and 37% of them were in doubt about whether legal aid is accessible and affordable. Just 29.6% of users believed that legal aid is readily available and affordable in their local areas, reflecting in general a lack of confidence and clarity in the existing legal aid system.

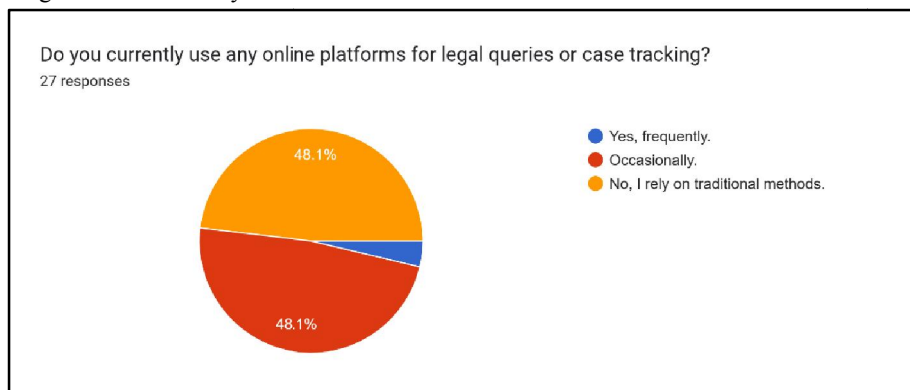




63% of the users selected all of the above options—easy-to-use interface, accuracy of legal information, and speed and efficiency—as the most important aspects of a legal AI assistant. This highlights that users are looking for a well-rounded solution that is not only reliable and fast but also user-friendly in their legal interactions

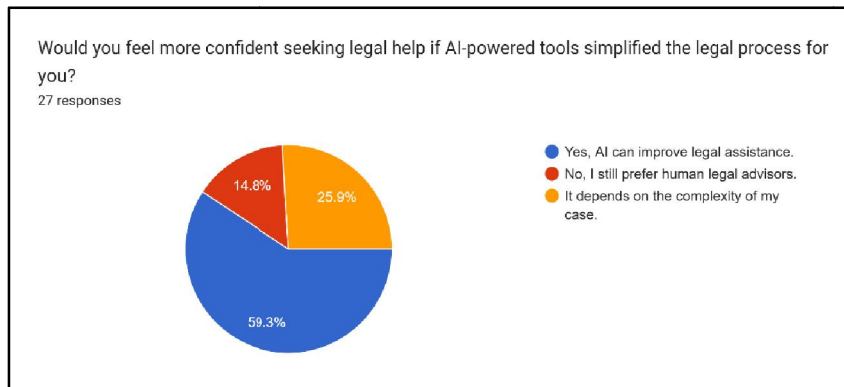


81.5% of the users favored an AI-powered legal assistant that provides both legal advice and case management features. This clearly shows that users appreciate an integrated solution that can not only advise them legally but also assist in managing their legal cases effectively.

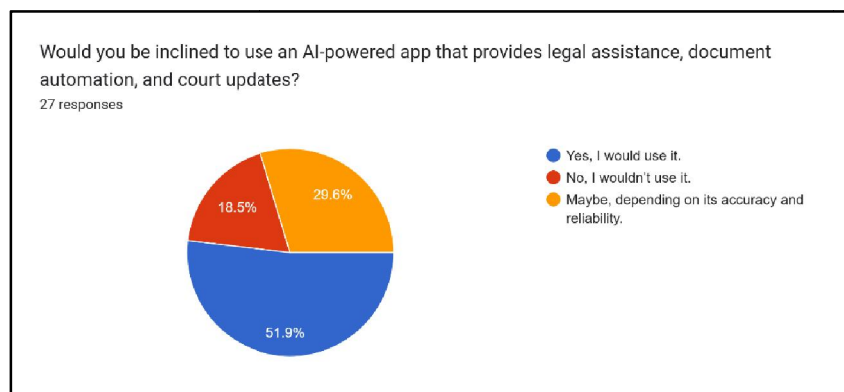


48.1% of the users stated that they do not use any online platforms for legal queries or case tracking and rely on traditional methods. This highlights a gap in the adoption of digital legal tools and points toward the need for a more accessible and user-friendly AI-based legal assistant like JurisAI.

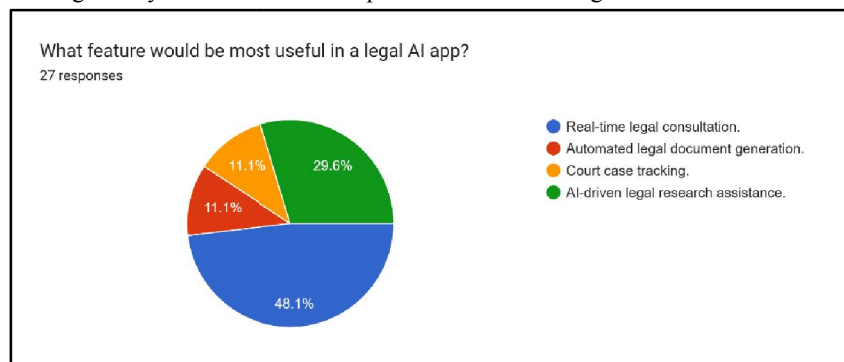




59.3% of the users concurred that they would feel more confident in availing legal assistance if AI-based tools made the legal process easy for them. This shows an increasing faith in technology and a need for smart solutions like JurisAI to make legal aid more accessible and efficient

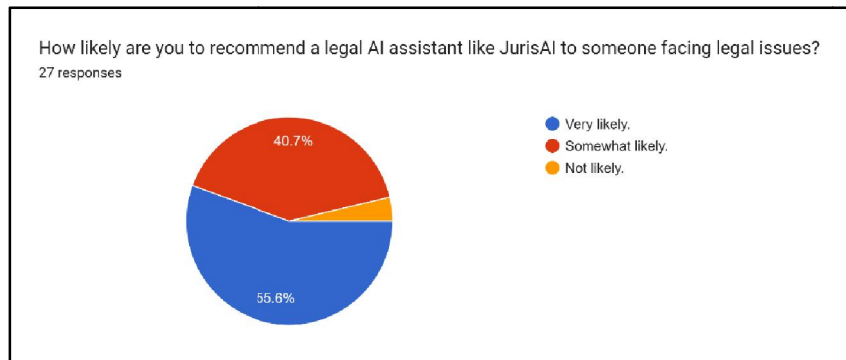


51.9% of the users said they would be willing to employ an AI-driven app that delivers legal support, document automation, and court updates. This is an indication of a positive approach towards the inclusion of technology within the legal arena, reflecting clearly on the need for complete and accessible legal solutions such as JurisAI.



48.1% of users chose real-time legal consultation as the most helpful feature in a legal AI app. This shows a strong desire among users for instant access to professional legal opinions, indicating a preference for quicker, more responsive solutions to addressing legal issues—a service JurisAI strives to provide competently.





55.6% of the users concurred that they would recommend a legal AI assistant such as JurisAI to someone with legal issues. This shows a high level of confidence and trust in AI-based legal assistance, underlining the capability of JurisAI to leave a positive influence in the lives of individuals experiencing legal issues

IV. USE-CASE DIAGRAM

At its most basic, a use case diagram is a representation of a user's interaction with the system that depicts the specifications of a use case. A use case diagram can depict the various types of system users and the various ways in which they interact with the system. This type of diagram is typically used in conjunction with a textual use case and is frequently accompanied by other types of diagrams. Because of their simplicity, use case diagrams may be an effective tool for stakeholder communication. The designs seek to simulate the real environment and give a perspective for stakeholders to comprehend how the system works will be constructed.

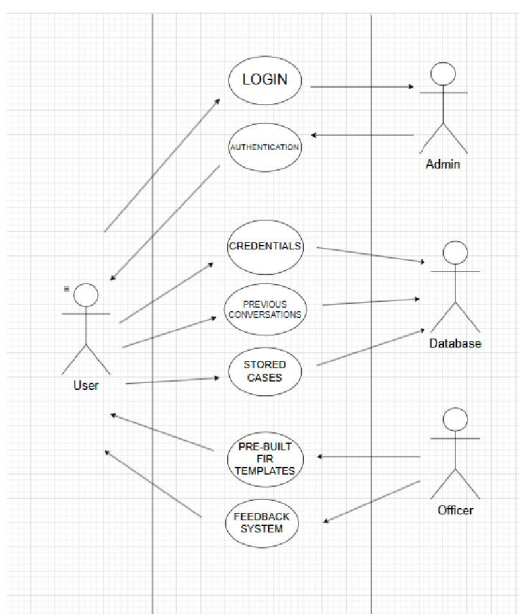


Fig.6: Use-Case Diagram Iteration 1

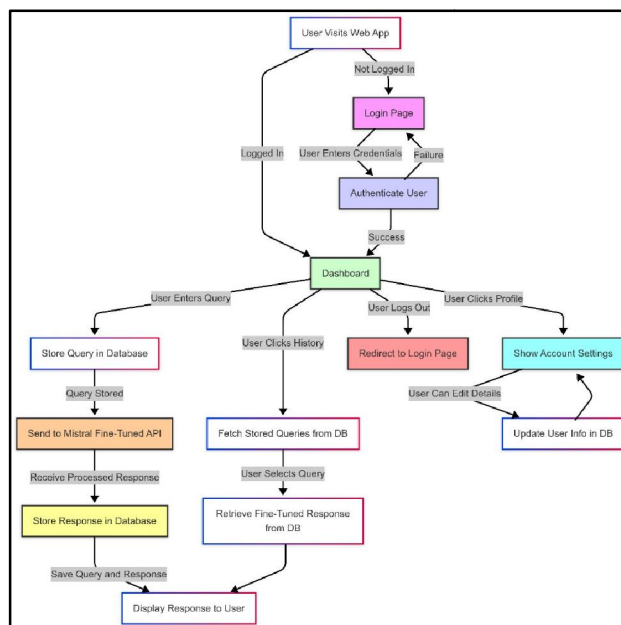
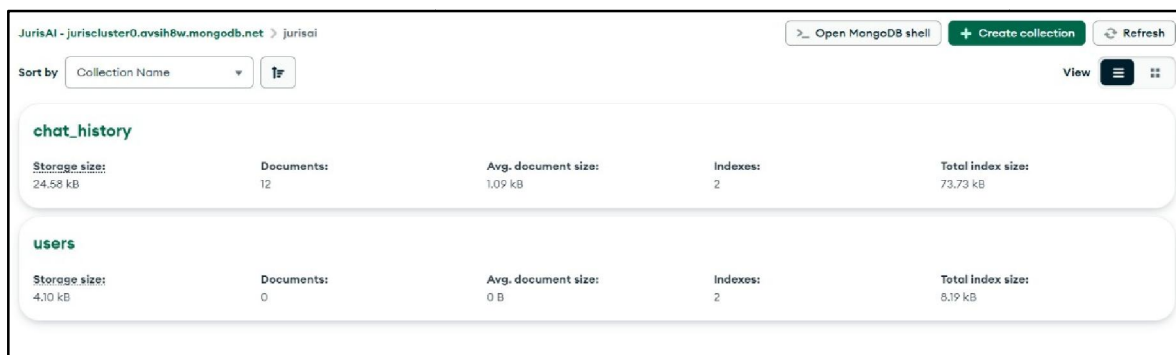


Fig.7: Use-Case Diagram Iteration 2



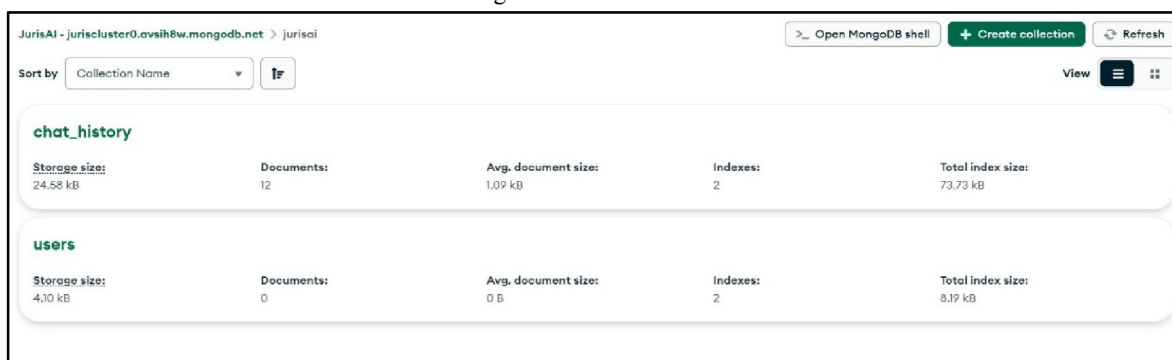
V. OUTPUT OF OUR APPLICATION



The screenshot shows the MongoDB Atlas interface for the 'jurisai' database. It displays two collections: 'chat_history' and 'users'. The 'chat_history' collection has 12 documents, a storage size of 24.58 kB, an average document size of 1.09 kB, 2 indexes, and a total index size of 73.73 kB. The 'users' collection has 0 documents, a storage size of 4.10 kB, an average document size of 0 B, 2 indexes, and a total index size of 8.19 kB.

Collection Name	Documents	Avg. document size	Indexes	Total index size
chat_history	12	1.09 kB	2	73.73 kB
users	0	0 B	2	8.19 kB

Fig.7:Database Structure



This screenshot is identical to the one in Fig.7, showing the MongoDB Atlas interface for the 'jurisai' database with collections 'chat_history' and 'users'.

Collection Name	Documents	Avg. document size	Indexes	Total index size
chat_history	12	1.09 kB	2	73.73 kB
users	0	0 B	2	8.19 kB

Fig.8:Database of our application

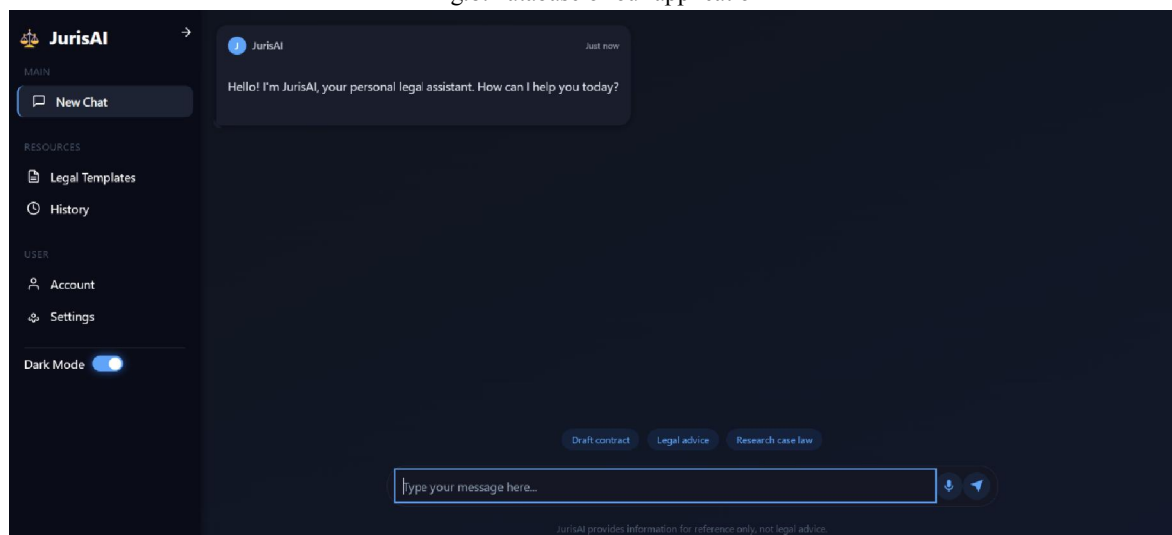


Fig.9:Home Screen



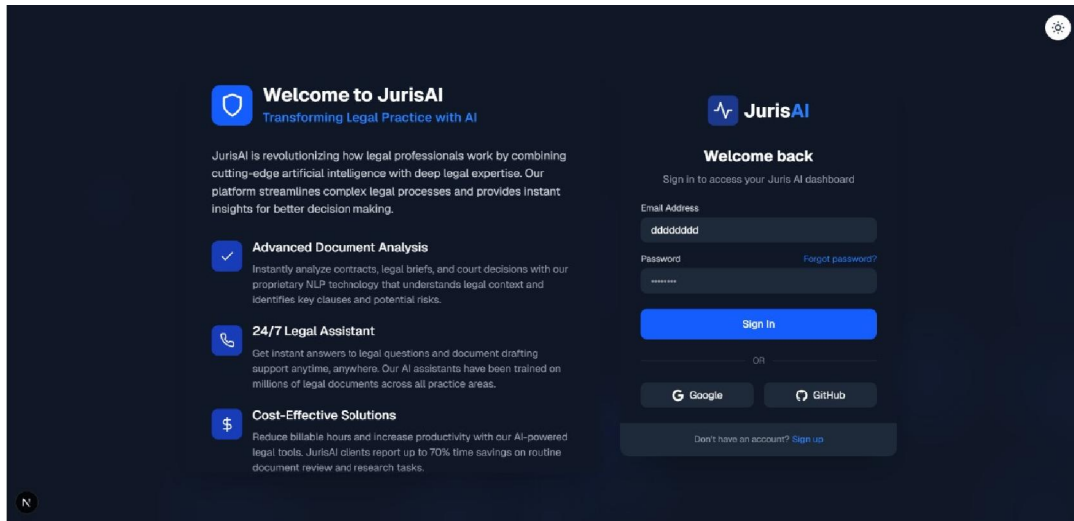


Fig.10. Login Screen of our application.

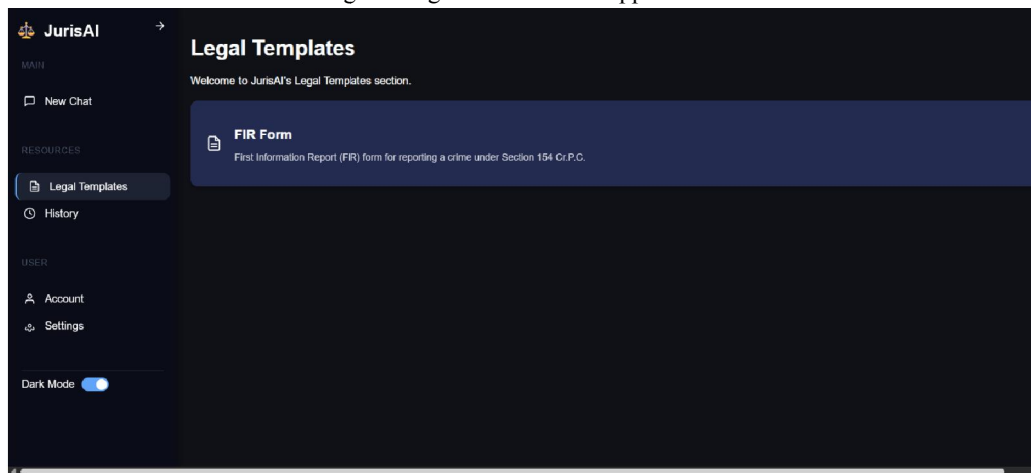


Fig.11. Legal Templates

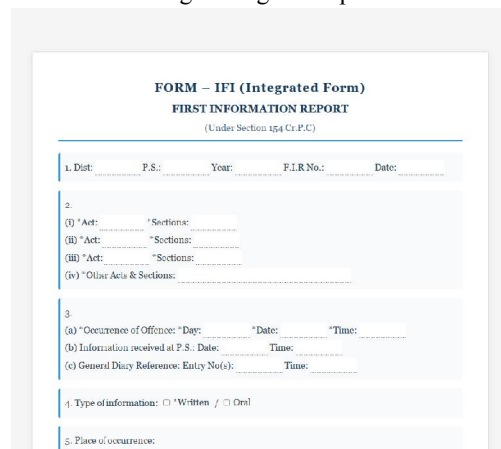


Fig.12: FIR Template



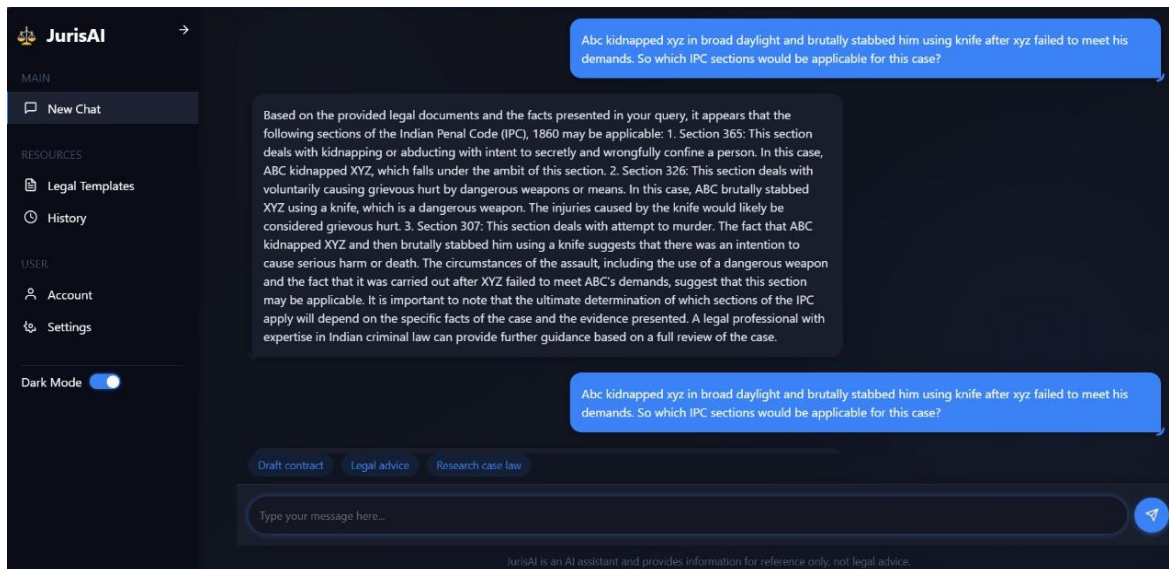


Fig. 13: The Legal AI assistance feature

VI. CONCLUSION

JurisAI has been an incredible learning experience, leading us through various phases of legal-tech usage and application of artificial intelligence in court proceedings. The question of how to utilize AI-generated legal documents, process information of cases, and decide on the validity of legal predictions has provided us with useful insights into the future of law and technology. We have experimented with machine learning algorithms, natural language processing, and automation techniques in this project in an attempt to design a system capable of assisting legal professionals and speeding up the filing of cases.

The steep rise in crimes against women (15.30%), children (16.60%), economic and cyber crimes (12.35%), and suicide fatalities (7.20%) as highlighted by the study is a testament to the urgency of legal reforms and effective case handling. JurisAI offers a technology solution to bridge this gap to enhance ease of access to justice, expedite case processing, and introduce transparency to legal procedures. Slowness in the judicial process, documentation, and delay in case resolution has the effect of deterring victims from seeking the law, which in turn causes further acceleration of underreporting and unregulated crimes.

While JurisAI provides a technology platform for legal empowerment, we understand that technology cannot solve deeply entrenched societal and systemic issues. A holistic approach—through law enforcement training, improved legal infrastructure, and sensitization of the public—is needed to create a safer and more just society. Through the application of JurisAI in legal institutions, we aspire to reduce case backlogs, enhance the efficiency of legal professionals, and assist in creating a more accountable judiciary. Ultimately, we aspire to strengthen legal frameworks, enable faster delivery of justice, and ensure that no victim is deprived of access to their fundamental rights.

VII. FUTURESOCPE

Although we have tried to incorporate all essential aspects during the development of JurisAI, certain elements had to be left out due to time, financial, and resource constraints. However, as with any technological solution, there is always room for improvement and expansion. The JurisAI system can be further enhanced in the following ways:

1. Integration with government legal bodies to ensure faster case processing and real-time judicial assistance.
2. Use of AI-powered predictive analytics to assess crime-prone areas and develop proactive legal interventions.
3. Automated emergency legal assistance in case of server downtime or connectivity issues, ensuring uninterrupted support.



4. Tracking of case progress through real-time AI monitoring, helping victims and legal professionals stay informed.
5. Enhanced accuracy of case documentation and evidence processing using advanced NLP (Natural Language Processing) models.
6. Seamless integration of client applications into a single AI-driven legal platform, providing a centralized legal ecosystem.

For further analytical advancements, we can leverage machine learning (ML) and big data analytics to enhance legal decision-making and predictive case outcomes. A specialized AI model, incorporating Time Series Analysis (TSA), could be used to forecast legal trends, predict case resolution timelines, and identify recurring legal issues. TSA is widely used in economic forecasting and market trends, and its application in legal analytics could revolutionize the judicial system by ensuring data-driven decision-making and proactive legal measures.

REFERENCES

- [1]. <https://www.civildaily.com/story/judicial-pendency/>.
- [2]. <https://statetimes.in/ncrbs-crime-report-a-call-to-awaken-countrymen-to-realize-dream-of-a-fair-and-just-society/>.
- [3]. <https://clpr.org.in/blog/caste-discrimination-in-south-india-a-study-of-ncrb-data-part-ii/>
- [4]. <https://www.bacancytechnology.com/blog/web-application-architecture>
- [5]. <https://www.geeksforgeeks.org/python2-vs-python3-syntax-and-performance-comparison/7>.

