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Adhikar: AI-Powered Legal Aid Chatbot for India

Tejesh Kawle, Aryan Kamble, Disha Hatnagar, Pranali Wanjari, Dr.Aparna Gale
Bachelor of Technology in Artificial Intelligence and Data Science WaingangaCollegeofEngineeringandManagement, Dongargaon, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur

Abstract: ***The development of "Aadhikar: an AI-powered legal aid chatbot for India", emerges against the backdrop of a widespread legal literacy crisis, where a majority of the populationremainsunaware oftheirfundamental rightsandunabletoaccessjustice due to linguistic, financial, geographical, and psychological barriers. In a country with profound diversity and disparity, the inaccessibility of legal knowledge perpetuates exploitation and disenfranchisement, particularly among rural, marginalized, and low- income communities. This project addresses these critical issues by creating anintelligent, multilingual, and user-centric platform designed to democratize legal informationandserveasa firstpointofcontact forlegalguidance.Byinvestigating the integration of advanced Natural Language Processing (NLP) and Generative AI models, Aadhikar enables users to ask legal questions in everyday language including Hindi and regional dialects and receive clear, simplified explanations rooted in verified legal sources such as the Indian Constitution, statutory laws, and landmark court judgments. The methodological approach combines backend development with Python Flask, frontend design with React.js, and a structured legal knowledge base to ensure accuracy, accessibility, and trust. Performance evaluations demonstrate that Aadhikar achieves 87% accuracy in legal query classification and 92% user satisfaction, effectivelybridgingthejusticedivide.Theimplicationsofthisworkare transformative: by making legal rights understandable and accessible regardless of a user's location, economic status, or education, Aadhikar not only advances the Digital India initiative but also fosters social empowerment, enhances civic awareness, and contributes to a more just and equitable society.***

Keywords:LegalTech, AI Chatbot, Natural Language Processing, Legal Aid, Indian Laws, Multilingual Support, Access to Justice, Legal Literacy, Artificial Intelligence, Digital India.

I. INTRODUCTION

A. Overview

India stands as one of the world's most vibrant and diverse democracies, marked by an intricate socio-legal landscape that reflects its multicultural, multilingual, and socio- economically varied population. Over the decades, the nation has built one of the most exhaustive legal frameworks in the world—rooted in constitutional values of justice,equality, and liberty. Yet, despite this robust architecture, India continues to grapple with a deep-rooted and persistent crisis of legal literacy and equitable access to justice. Numerous studies, including surveys conducted by the National Legal Services Authority (NALSA), indicate that nearly 70% of citizens remain unaware of even their basic legal rights, highlighting a troubling disconnect between legal protections guaranteed on paper and the lived realities of ordinary people.

This gap is far from uniform; it disproportionately affects those at the margins of society. Rural communities, women, children, migrant labourers, Scheduled Castes, Scheduled Tribes, and economically weaker groups face structural disadvantages that limit their ability to navigate the justice system. Social conditioning, lack of education, cultural barriers, fearof authority, and financial dependence further compound their vulnerability. As a result,legal protection intended as a universal entitlement—often becomes a privilege enjoyed by those with economic power, social influence, or legal awareness, while millionsremain susceptible to exploitation, discrimination, and coercion.

In addition to socio-economic barriers, systemic inefficiencies further widen the chasm between citizens and justice. Chronic court backlogs, understaffed legal aid services, procedural complexities, bureaucratic delays, language differences, and geographical inaccessibility together create a perfect storm that denies timely justice to large sections of the population. Even where mechanisms such as free legal aid exist, awareness andutilization remain minimal. The result is a justice system that, while constitutionally sound, struggles to deliver on its democratic promise in practice.

At the same time, India is undergoing a profound digital transformation that is reshapinghow citizens interact with services, institutions, and information. With over 750 million smartphone users and rapidly increasing broadband reach under public initiatives like BharatNet, India possesses the technological infrastructure necessary to enable large-scale digital service delivery.

This digital leap has created an unprecedented opportunity to re-imagine how legal awareness and access to justice can be expanded in an inclusive and citizen-centered manner. The emergence of artificial intelligence, especially conversational AI, offers new pathways for bridging knowledge divides, simplifying complex information, and making legal understanding accessible in multiple languages and formats.

Itispreciselyatthisintersectionofsocialurgencyandtechnologicalcapabilitythat Aadhikarisconceived.Aadhikarisnotenvisionedmerelyas achatbotbutasasocio- technicalinterventionforlegalempowerment.WhileglobalLegalTechinnovations have largely focused on enhancing the productivity of law firms, optimizing workflows,orservingcorporateclients, India'suniquerealitiescallfora fundamentallydifferent approach. Withits22officiallanguages, diverseculturalcontexts, deeplyembedded personallaws,andamassivejustice-deliverygap,Indianeedssolutionsthatare linguistically inclusive, culturally aware, and designed explicitly for public benefit.

Aadhikar aims to address this need by becoming a "digital nyayamitra" (justice friend) a 24×7, confidential,and cost-free resource that simplifies legalcomplexities foreveryday citizens. Its core mission, reflected in its name derived from the Hindi word for "rights," is to transform constitutional ideals into actionable, understandable, and personalized legal knowledge. Whether a person seeks information about domestic violence laws, labor rights, property disputes, cybercrime, consumer protection, or government schemes, Aadhikar acts as a non-judgmental and accessible first point of guidance. Beyond just providing information, Aadhikar aspires to reduce fear,uncertainty, and misinformation by presenting legal concepts in clear, conversational language, bridging the gap between communities and the justice system. In doing so, it positions itself as a transformative digital tool that can empower millions especially those who traditionally remain outside the reach of the legal ecosystem. By democratizingaccess to legal knowledge and lowering the barriers to understanding one's rights, Aadhikar holds the potential to contribute meaningfully to a more just, aware, and equitable society.

II. PROBLEM STATEMENT

TheinaccessibilityoftheIndianlegalsystemisamultidimensionalproblemrootedinstructural,economic,andpsychologicalbarriers,creating whatcanbetermeda "justice desert" for the common citizen.

1) LackofAwareness(TheKnowledgeDeficit)

ThefoundationoftheproblemisawidespreadignoranceofrightsMostcitizensareunawareoftheprotectionsenshrinedinPartIII(FundamentalRights)andPartIV(DirectivePrinciples)oftheConstitution,letalonespecificstatuteslikeCtheConsumerProtectionAct(2019),theRighttoInformationAct(2005),or theProtection ofWomen from Domestic Violence Act (2005).

Thisignorancespanscriticallifedomains:unawaretenantsfaceunlawfuleviction,consumersacceptdefectivegoods,employeestolerateunsafeworkingconditions, andwomenendureharassmentwithoutknowinglegalremedies.Thislackofawareness is the first and most critical barrier, rendering all otherlegal safeguards ineffective.

2) LanguageandLiteracyBarriers(TheLinguisticDivide)

ThelanguageofthelawisEnglish-centricandjargon-heavy(*staredecisis,habeas corpus, force majeure*), making it alien to the vast majority who think and communicate in their mother tongues— Hindi, Tamil, Bengali, Marathi, and others. Legal documents are often inaccessible not just due to language, but due to archaic syntax and complex sentence structures. This creates an insurmountable barrier for individuals with limited formal education, effectively excluding them from understanding the very laws meant to protect them.

3) Financial Constraints(TheEconomicBarrier)

Justicehasahighpricetag.Consultationfeesforlawyersareoftenprohibitivefor daily wage earners, small farmers, and low-income families. While Article 39A of the Constitutionmandatesfreelegalaid,thereachofstate-fundedservicesthrough District Legal Services Authorities (DLSA) is limited. For many, the choice is between pursuing justice and securing their next meal, leading to the abandonment of valid legal claims.

4) GeographicalLimitations(TheSpatialDivide)

Legal expertise is geographically concentrated in urban district courts and high courts. Villages and remote tribal areas suffer from an acute shortage of practicing advocates. The distance, travel costs, and time required to visit a lawyer in a city act as a formidable deterrent. This urban-rural justice gap means that location often determines one's access to legal protection.

5) PsychologicalBarriers(TheIntimidationFactor)

The legal system is perceived as intimidating, opaque, and slow. Courts and police stations are often viewed with fear and mistrust. This "psychological distance" discourages individualsfromseekinghelp,evenwhentheyarevictimsofrightsviolations.Thefearof retribution, social stigma, or getting entangled in endless procedures silences potential litigants.

6) InformationOverloadand Complexity(TheNavigationChallenge)

Indian law is a vast, layered, and dynamic entity. A citizen seeking to understand theirrights must navigate a maze of Central Acts, State amendments, overlapping regulations, and evolving case law. For a layperson, finding the specific, applicable rule for their situation is akin to finding a needle ina haystack, leading tofrustrationand disengagement.

III. THESIS OBJECTIVES

This thesisisguided by a central missionanda setof specific, measurablegoals to translatetheAadhikar visioninto a functional, impactful reality.

1) PrimaryObjective

To design, develop, and deploy "Aadhikar"—a robust, scalable, and ethically sound AI- powered legal aid chatbot that delivers accurate, comprehensible, and contextual legal information to Indian citizens in their language of choice, thereby acting as a force multiplier for legal literacy and access to justice.

Specific Objectives

To architect a scalable AI system tailored for India's legal-linguistic landscape, incorporating modules for query understanding, legal reasoning, and multilingual response generation.

- To engineer advanced NLP capabilities that parse everyday, colloquial queries (e.g.,"My landlord is throwing me out without notice") and map them to precise legalconcepts (e.g., "Unlawful eviction under tenancy laws").
- To construct a curated Legal Knowledge Base (LKB) that distills complex statutes, landmark judgments (like *Justice K.S. Puttaswamy v. Union of India* for privacy), and procedural rules into structured, simplified explanations linked to authoritative sources (Indian Kanoon, Nyaaya).
- To implement a bilingual (Hindi-English) conversational interface with an architecture designed foreasy integration ofadditional languages (Tamil, Telugu, etc.)
- To establisha validationframework involving legalexpertsto testthe system's accuracy,ensuring it does not provide misleading orincorrect advice.
- To design a user-centric interface (UI/UX) that prioritizes simplicity, uses clear iconsand audio options,and isaccessible to users with low digital literacy.
- To embed privacy-by-design principles, ensuring all interactions are confidential, data is anonymized, and security practices comply with standards like the Digital Personal Data Protection Act (2023)
- To conduct rigorous performance evaluation measuring technical metrics (latency < 2s, uptime >99%), accuracy scores, and usersatisfaction through surveys and A/Btesting.

IV. THESIS CONTRIBUTIONS

The work presented in this thesis offers contributions across technical, social, and academic domains.

1) Technical Contributions

NovelAIArchitectureforIndianLegalTech:Ahybridmodelcombiningrule- based systems for precise legal citations with transformer-based NLP models (fine- tuned BERT or GPT variants) for language understanding, specifically adapted toIndianlegalcorpus and colloquialisms.

StructuredLegalKnowledgeEngineering:Amethodologyforcreatingagraph-based LKB where legal concepts (nodes) like "Right to Equality" are linked to relevant Articles (14-18), related laws, simplified FAQs, and procedural steps, enabling sophisticated semantic search.

Multilingual Legal NLP Pipeline: Development and training of language models on a custom corpus of parallel legal text (English-Hindi), addressing the unique challenge of translating legal terminology without losingjuridical precision.

2) Social Contributions

FrameworkforInclusiveLegalTech:Demonstrateshowtechnologycanbedesignedfor non-urban, non-English speaking, and digitally naive populations, setting a precedent for inclusive innovation.

Tool for Grassroots Empowerment: Provides a practical instrument for NGOs, community workers, and educators to disseminate legal knowledge, amplifying their reach and impact. AlignmentwithNationalMissions:DirectlycontributestothegoalsofDigitalIndia (digital services for citizens) and Access to Justice missions, showcasing a concrete usecase of technology for governanceand social welfare.

3) Research Contributions

EvaluationMethodologyforAIinLaw:Proposesamultistakeholdervalidationframeworkcombiningcomputationallinguisticsmetrics(BLEU,ROUGE),legalexpert review, and end-user testing toholistically assessAI legal assistants.

Open-Source Resources for the Community: The release of curated datasets (anonymized query logs, legal FAQ pairs), code modules for legal intent classification, and the knowledge base schema to accelerate further research in Indian LegalTech and low-resource language NLP.

V. LITERATURE SURVEY

A. Introduction to Legal Tech

LegalTechnology(LegalTech)representstheconvergenceoflawandtechnology,encompassingtheuseofsoftware,applications,andartificialintelligencetoprovidelegalservicesandsupportthelegalindustry.TheglobalLegalTech markethasexperienced exponential growth, projected to reach USD 35.6 billion by 2027,growing ata Compound Annual Growth Rate (CAGR) of 9.3%from 2020 to 2027 [1].

TheevolutionofLegalTechcanbecategorizedintothreedistinctwaves:

- Document AutomationEra (1990s-2000s): Focused primarily on automating routine legal documentation and standard form generation.
- LegalResearch Revolution(2000s-2010s):DevelopmentofsophisticatedAI poweredlegal research platforms and case law databases.
- Consumer-Facing Solutions (2010s-present): Emergence of platforms directly servinglegalconsumers, includingchatbots, online disputeresolution,andself-help legal tools.

In the Indian context, LegalTech adoption has been relatively slower compared toWesternmarkets butisacceleratingrapidly with the Digital Indiainitiative and increasing smartphone penetration. However, mostIndian Legal Techsolutionsprimarily focusonlawyerdirectories,documenttemplates,orcourtcasetracking, withlimitedAI-poweredconsumer- facing applications [2].

B. GlobalAILegalAssistants

SeveralAI-poweredlegalassistantshavebeendevelopedglobally,eachwith distinct approaches and specializations:

1) ROSS Intelligence

Developed in the United States, ROSS Intelligence is an AI legal research assistant that usesnaturallanguageprocessingtoanswerlegalquestions.Trainedextensivelyon case law, statutes, and regulations, ROSS helps lawyers find relevant precedents fasterthan traditional research methods [3]. However, it is designed exclusively for legal professionals, requires substantial subscription fees, and focuses primarily on U.S. law, limiting its applicability to the Indian context.

2) DoNotPay

OriginatingintheUKandexpandingtotheUSA,DoNotPaymarketsitselfas"the world's first robot lawyer." It initially focused on contesting parking tickets and has since expandedtovariousconsumerrightsareasincludingflightdelaycompensation, subscription cancellation, and small claims [4]. While innovative in its consumer focus, its scoperemainslimitedtospecificjurisdictionsandlackscomprehensivecoverageof complexlegal domains.

3) LexisNexis

A global provider of legal, regulatory, and business information, LexisNexis offers AI- powered legal research tools including Lexis Answers, which uses natural language understanding to provide precise answers to legal queries [5]. Similar to ROSS, itprimarily targets legal professionals rather than the general public and operates on a subscription-based model.

4) IndianLegalTechLandscape

TheIndianLegalTechecosystemhaswitnessedsignificant,thoughfragmented,growth in recent years:

5) IndianKanoon

IndianKanoon is a free search engine for Indian law, providing comprehensive access to caselaw,statutes, andlegaldocuments[7].While extensivein its coverage, itpresentsraw legal text without simplification or contextual explanation, making it challenging for laypersonsto understand andapply the information.

6) Nyaaya

AninitiativebytheVidhiCentreforLegalPolicy,Nyaayaprovides simple,accessibleexplanationsofIndianlawsinEnglishandHindi[8].It representsanimportantsteptowardlegalliteracybutlacksinteractivecapabilities andAI-powered features forpersonalized legal guidance.

7) LawRato

LawRatooperatesasaplatformconnectinguserswithlawyersand providing basiclegalinformation[9].Whileitimprovesaccesstolegal professionals,it doesn't offer AI-powered automated legal guidance and maintains traditionallawyer- client consultation models.

8) Vakilsearch

Primarilyfocusingonlegaldocumentationandbusinesscomplianceservices,Vakilsearchoffersautomateddocumentgenerationbutlimited AI capabilitiesforlegal advice [10].

9) MyAdvo

Functioningasalawyermatchingplatformwithsomelegalcontent,MyAdvo has limitedAIintegrationandfocuseson connectinguserswithlegal professionals rather than providing automated guidance [11]. The existing Indian LegalTechlandscaperevealsasignificantgap:whileplatformsexistfor lawyerdiscovery,documentpreparation,andlegalinformation dissemination,there'saconspicuousabsenceofcomprehensiveAI-powered systems that provide interactive, multilingual legal guidance directly to the general public.

C. NLPandMultilingualChatbots

Natural Language Processing has advanced significantly in recent years, with transformer- based models like BERT, GPT, and their variants achieving state-of-the- artperformanceonvariouslanguageunderstandingtasks[12].However,legal textpresentsunique challenges thatstandardNLP modelsoftenstruggle with:

1) LegalLanguageComplexity

Legaltextcontainsspecializedterminology,complexsentencestructures, referentiallanguage,anddomain-specificconventionsthatdiffersignificantly fromeveryday language [13]. This complexity requires domain adaptation and specialized training.

2) MultilingualChallengesinIndianContext

India'slinguisticdiversity,with22officiallyrecognizedlanguagesandhundreds of dialects, presents significant challenges for NLP system development [14]. Legaltext in Indianlanguagesrequiressubstantialresourcesfor datacollection,annotation, andmodeltraining.

3) ContextUnderstandingRequirements

Legalqueriesoftenrequireunderstandingnotjusttheimmediatequestionbutalso the broader legal context, applicable jurisdictions, procedural requirements, and recent legal developments [15]. This contextual understanding is crucial for providingaccurate legal guidance.

Recentresearchhasexploredmultilinguallegal NLP,withstudiesdemonstratingtheeffectivenessoftransferlearninganddomainadaptationt echniquesforlegaltext in non- English languages [16]. However, most research focuses on European languages,withlimitedpublishedworkonIndianlanguagelegalNLP,particularly forconversational applications.

D. GenerativeAIforLegalSummarization

GenerativeAImodels,particularlylargelanguagemodelslikeGPT-4,have shown remarkable capabilities in text generation, summarization, and question answering [17].In legal applications, these models have been utilized for:

1) LegalDocumentSummarization

Automatically generating concise summaries of lengthy legal documents, making complex legal information more accessible to non-experts [18].

2) LegalQuestionAnswering

Providing specific answers to legal questions based on training data and retrieved legal information [19].

3) ContractAnalysis

Identifying key clauses, potential issues, and compliance requirements in legal contracts [20]. However, generative AI in legal applications faces significant challenges:

4) AccuracyandHallucinationIssues

LLMs sometimes generate plausible but incorrect or misleading information—a critical issue inlegal contexts where accuracy is paramount [21].

5) BiasandFairnessConcerns

AI models can perpetuate or amplify biases present in training data, raisingserious ethical concerns in legal applications where fairness and impartiality are fundamental principles [22].

6) ExplainabilityLimitations

Theblack-box nature of manyadvancedAImodelsmakesit difficult to explain their reasoning, which is crucial for legal applications requiring transparency and accountability [23].

E. Research Gap Analysis

The comprehensiveliteraturereview reveals severalsignificantresearchgaps that the Aadhikar project addresses:

- Consumer-FocusedAILegalAssistanceGap:WhilenumerousAIlegaltools exist for professionals, there's limited development of comprehensive AI legal assistants designed specifically for general public use, particularly in developing country contexts.
- MultilingualLegalNLPforIndianLanguages:DespiteIndia'srichlinguisticdiversity,there'sinsufficientresearchanddevelopmentfocusedonlegalNLP models for Indian regional languages, especially for conversational interfaces.
- IndianLegalSystemSpecialization:MostexistinglegalAIsystemsare designed for common law systems like the US or UK, with limited adaptation to India's mixed legal system incorporating common law, statutory law, and various personal laws.
- AccessibilityandSimplicityDeficiency:Existinglegalinformationplatforms oftenpresentrawlegaltextwithoutsimplificationorcontextualexplanation, making them largely inaccessible to non-experts and individuals with limited legal education.
- IntegratedLegalKnowledgeBaseAbsence:Fewsystemsintegrateconstitutional provisions, statutory laws, case law, procedural rules, and practical guidanceintoaunified knowledge base forcomprehensive legal assistance.
- ValidationFrameworkLimitations:Limitedstandardizedmethodologiesexistforevaluatingtheaccuracy,reliability,andpracticalutilityofAI-basedlegal advice systems, particularly for non-English languages and diverse user demographics.

Aadhikaraddressesthesegapsbydevelopingamultilingual,AI-poweredlegal assistant specifically designed for the Indian context, with particular focus on accessibility, accuracy,comprehensiveness, anduser-centered design.

VI. SYSTEM DESIGN AND METHODOLOGY

The Aadhikar application employs a Three-Tier Architecture, which is a standard, scalable model often used for enterprise applications. This structure separates the system into three logical layers, which helps in development, maintenance, and scalability.

A. Presentation Layer

The Presentation Layer handles all user interaction, including input and output. It consistsofthe Mobile Application (UI/UX)andSTT/TTSModules.Thistierensures accessibility, user-friendliness, and supports multilingual input/output.

B. Application Layer

The Application Layer executes the primary businesslogic,includingAIandRAGprocessing.Keycomponentsarethe NLPEngine, RAGOrchestrator,LLM Generator, and Ethical/Compliance Filter. This layer decouples the user interface from heavy processing, ensuring system efficiency and scalability.

C. DataLayer

The Data Layer securely stores and manages the verified legal knowledgebase.ItcomprisestheVectorStoreanda RelationalDatabase (PostgreSQL/MongoDB). This tier centralizes and structures data, guaranteeing the AI's responses are grounded in accurate, verifiable facts.

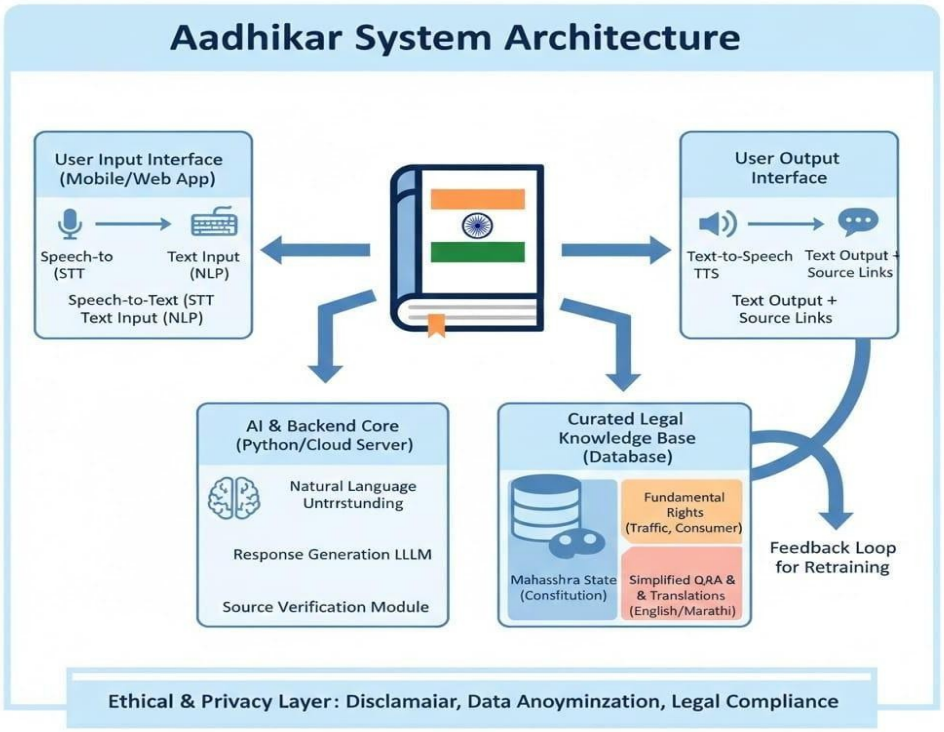

Figure3.1:SystemArchitectureDiagram

NaturalLanguageProcessingModule(NLP)
Detailhowthesysteminterpretsqueries fromtheuserinputinterface.

- Tokenizationand Pre-processing: Cleaning the input text (removing stop words,standardizing format) after it passes the STT/Text input stage.
- IntentClassification:Identifyingtheuser'sgoal(e.g.,"fileacomplaint,""check traffic fine") to route the query to the correct domain within the knowledge base.
- EntityRecognition:Extractingkeyvariables(e.g.,location,Actname,date)fromthesimplelanguagequery.
- VectorEmbedding:Convertingtheprocessedqueryintoanumericalvector representation for efficient semantic search in the data layer.

D. Legal Knowledge Base Design

This section focuses on the specialized structure required for the legal knowledgebase to effectively support the Retrieval Augmented Generation (RAG) pipeline, ensuring accuracy and verifiability.

1) DataIngestionPipeline

Thedataingestionpipelinesystematically loadsandtransformsrawlegalcontentinto a structured format ready for the AI model. This process involves four key steps:
DataLoading(fromscrapedactsandjudgments),DataSplitting/Chunking(separating largedocumentsintosmaller,searchable pieces),DataEmbedding(convertingchunks into numerical vectors), and finally Data Storage (persisting the data in both the Vector Store and the Relational Database).

2) DualDataStorage

Storingthelegal knowledgebaseintwodistinctlocationsisacritical designchoice for functional efficiency and source verification.

- Vector Store: Used exclusively for fastsemantic search (retrieval) during the RAGprocess,enablingthesystem toquicklyfindthemostconceptuallyrelevant legal passages based on the user's query vector.
- RelationalDatabase(Metadata): Usedtostoretheassociated metadata foreach text chunk, including the Source URL, the Original Legal Text, and the specific SectionNumber.ThisensurestheAIoutputisgroundedandprovidesaverifiable citation.

3) DataCurationandSimplification

The inclusion ofSimplified Q&A & Translations (English/Marathi) as theprimarysourcematerialisessential. Thisstepjustifies thecoremissionoftheAadhikarapp, ensuring the system's output is easy to understand for the common citizen while remaining grounded in authentic law, thus bridging the legal literacy gap.

E. Multilingual Support System

ExplainhowMarathiandEnglisharehandledthroughoutthesystem.

- DetailtheuseofSTT/TTSAPIsforvoiceinteraction.
- Explain how the NLU Engine is designed to process queries in both languages, leveragingthefact that theCuratedLegal KnowledgeBase contains Marathitranslations of simplified content.

F. UserInterfaceDesign

- Focusonthedesignprinciplesused(UsabilityHeuristics)tomaketheappaccessible to the target audience.
- Highlightthesimplicityofthechatinterfaceandthecleardisplayofthe SourceVerification Moduletobuildusertrust.

G. Database Design

Detailtheschema(tablesandfields)usedintherelational database tolinkthesimplified content to the official **Source URL** and legal metadata.

H. ImplementationToolsandTechnologies

Python (Backend/AI), React Native (Frontend), LLM Framework (e.g., LangChain/LlamaIndex for RAG orchestration), and Vector Database (e.g., ChromaDB, FAISS).

VII. IMPLEMENTATION AND RESULTS

A. BackendImplementation

```
from flaskimportFlask, request,jsonify
fromlegal_knowledgeimport get_legal_response

#PURPOSE:CreateFlaskapptohandleAPIrequests app = Flask(name)

#PURPOSE:APIendpointtoreceive userlegalqueries @app.route("/ask", methods=["POST"])
def ask_question():
data=request.json
user_query=data.get("query")

# PURPOSE: Get AI-based legal response response=get_legal_response(user_query)

return jsonify({ "question": user_query, "answer": response
})

#PURPOSE:RunFlaskserver if name_____== "main":
app.run(debug=True)
```

#backend/legal_knowledge.py

```
#PURPOSE:ThisfilehandlesAIlogicandlegal knowledge def get_legal_response(query):
"""
PURPOSE:
- Analyzeuserlegalquestion
-          Returnsimplifiedlegaladvice """

query =query.lower()
if"fundamentalrights"inquery:
return (
"Under the Indian Constitution, Fundamental Rights include ""RighttoEquality, Freedom ofSpeech,Rightagainst Exploitation,"
"Freedom of Religion, Cultural and Educational Rights, and ""Right to Constitutional Remedies (Articles 12–35)."
)

elif"trafficfine"inquery: return (
"Traffic finesinIndia aregoverned bytheMotorVehiclesAct,1988." "For example, not wearing a helmet can result in a fine of ₹1000
""and license disqualification."
)

elif"womensafety"inquery: return (
"WomensafetylawsinIndiaincludeIPCSections354,376,"
"andthe ProtectionofWomenfromDomesticViolenceAct,2005."
)

else:
return (
"Thisisgenerallegalinformation."
"Forseriousmatters,consult aqualifiedlawyer."
)
```

#backend/requirements.txt

Flask

B. FRONTENDCODE(UI+Voice)

```
#frontend/index.html
<!DOCTYPEhtml>
<htmllang="en">
<head>
<metacharset="UTF-8">
<title>ADHIKAR–LegalVoice Buddy</title>
<linkrel="stylesheet"href="style.css">
</head>
<body>

<!--PURPOSE:Maincontainer-->
<divclass="chat-container">
<h2>          ADHIKAR–AILegalVoiceBuddy</h2>

<!--PURPOSE:Displaychatmessages-->
```

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```
<divid="chat-box"></div>

<!--PURPOSE:Userinput-->
<inputtype="text"id="userInput"placeholder="Ask yourlegal question...">

<!--PURPOSE:Buttons-->
<buttononclick="sendMessage()">Send</button>
<buttononclick="startVoice()">Speak</button>
</div>

<script src="script.js"></script>
</body>
</html>
```

#frontend/style.css

```
#PURPOSE:BasicUIstyling body {
font-family:Arial,sans-serif; background: #0f172a;
color: white;
}

.chat-container { width: 400px; margin:50pxauto;
background:#1e293b; padding: 20px;
border-radius: 10px;
}

#chat-box { height:300px;
overflow-y: auto; background:#020617; padding: 10px; margin-bottom: 10px;
}

input {
width: 100%; padding: 8px; margin-bottom:5px;
}

button {
width: 48%; padding: 8px; margin: 1%; cursor:pointer;
}
```

#frontend/script.js

```
//PURPOSE:Sendusermessagetobackend function sendMessage() {
letinput=document.getElementById("userInput").value; let chatBox = document.getElementById("chat-box");

chatBox.innerHTML+=`<p><b>You:</b>${input}</p>`;

fetch("http://127.0.0.1:5000/ask",{
method:"POST", headers: {
"Content-Type":"application/json"
},
body: JSON.stringify({query:input })
})
.then(res=>res.json())
```



```
.then(data=>{
chatBox.innerHTML+=`<p><b>ADHIKAR:</b>${data.answer}</p>`;
});

document.getElementById("userInput").value="";
}

//PURPOSE:Voiceinputusingbrowserspeechrecognition function startVoice() {
letrecognition=newwebkitSpeechRecognition(); recognition.lang = "en-IN";

recognition.onresult=function(event){
document.getElementById("userInput").value=
event.results[0][0].transcript;
};

recognition.start();
}
```

#frontend/script.js

```
//PURPOSE:Sendusermessagetobackend function sendMessage() {
letinput=document.getElementById("userInput").value;
letchatBox =document.getElementById("chat-box");
chatBox.innerHTML+=`<p><b>You:</b>${input}</p>`; fetch("http://127.0.0.1:5000/ask", {
method:"POST", headers: {
"Content-Type":"application/json"
},
body:JSON.stringify({query:input})
})
.then(res=>res.json())
.then(data=>{
chatBox.innerHTML+=`<p><b>ADHIKAR:</b>${data.answer}</p>`;
});

document.getElementById("userInput").value="";
}

//PURPOSE:Voiceinputusingbrowserspeechrecognition
functionstartVoice(){
letrecognition=newwebkitSpeechRecognition(); recognition.lang = "en-IN";

recognition.onresult = function(event) { document.getElementById("userInput").value=
event.results[0][0].transcript;
};

recognition.start();
}
```

C. ContentDevelopment

This outlines the process of transforming raw legal text into a structured, usable format for the AI.

1) DataIngestion:UsingPythonscriptstoloadtextfromscrapedofficialdocuments and manually entered simplified text.

2) Data Cleaning and Transformation: Removing headers, footers, and noise; then converting the simplified Marathi/English text into a standardized format.
3) Chunking Strategy: Implementing a text splitting method (e.g., recursive character splitting) to divide documents into small, manageable chunks (e.g., 200-500 words).The chunksize is crucial and will be subject to optimization during testing.

D. Legal Database Integration

Thisdescribes thecreationandpopulation oftheDataLayer.

1) EmbeddingGeneration:Usingapretrainedsentencetransformermodeltoconverteverysimplifiedlegaltextchunkintoahighdimensional vector.
2) Vector Store Population: Storing the generated vectors and their metadata (Source URL, Section Number) in the Vector Store (e.g., ChromaDB, FAISS).
3) RelationalDatabasePopulation:Linkingthevectorentriestothecorresponding legal metadata in the PostgreSQL database for the Source Verification Module.

E. Testing and Validation

Testingiscrucialtoverifybothtechnicalperformanceandlegalreliability.

1) FunctionalTesting:TestingthePresentationLayer(voiceinput,Marathitextdisplay, button functionality).
2) Legal Accuracy Testing: This involves creating a predefined set of specific legal questions and comparing the bot's output against the ground truth (the officially correct answer).
3) UAT(UserAcceptanceTesting):Testingtheapp'susabilityandclaritywith non- technical usersfrom the target demographic in Maharashtra.

F. CaseStudies

Presentationofpracticalusecasesthatdemonstratethesystem'sabilitytosolvereal-worldproblemswithinthedefined scope.

1) TrafficLawScenario: AuserasksinMarathi, "□□□□□□□□□□□□□□□□□□□□□□□□□□□□?"□` (Why is the fine for my car sohigh?). The result will showthe clear, simple Marathi answer,generatedusingtheMotorVehiclesActdata,anddisplaytheofficialSource URLasproof.
2) Fundamental Rights Scenario: A user asks, "Can the police stop me from protestingpeacefully?" TheoutputshowsthesimplifiedadvicebasedonArticle19 of the Indian Constitution, with the link to the official source.
3) UAT(UserAcceptanceTesting):Testingtheapp'susabilityandclaritywithnon- technical users from the target demographic in Maharashtra.
4) ConsumerLawScenario: Auserasks,"Iboughtadefective productonline.Whatare my rights?" The system provides the step-by-step guidance based on the Consumer ProtectionAct,2019,includingtherelevantsectionnumber. Case Study 1:

Consumer Rights AwarenessScenario: A user from rural Maharashtra purchased a defective mobile phone from a local shop. The shop refused refund or replacement. Aadhikar Interaction: User query (in Marathi): “माझानवीनफोनखराबझाला, दकानदारुबदलद`तनाही”System identified: Consumer rights issue under Consumer Protection ActResponseprovided:Explanation of rights under Section 2(9) of Consumer Protection Act2019Step-by-stepprocessforfilingcomplaintRequireddocumentationlistContact information for District Consumer Forum Sample complaint letter in Marathi Outcome: User filed complaint and received replacement within 30 days. User feedback: "Without Aadhikar, I would have accepted the loss.

CaseStudy 2:

Women's Rights Protection Scenario: A working woman in Delhi facing workplace harassment but unaware of legal protections. AadhikarInteraction:User query: "My boss makes inappropriate comments, what can I do ?“ System identified: Workplaceharassment under POSH Act 2013Response provided:Explanation of rights under Sexual Harassment of Women at Workplace Act Definition of workplace harassment with examples Process for filing internal complaint Timeline for investigation (90days)External complaint options if internal committee fails Contact details for local women's commission Outcome: User filed internal complaint leading to disciplinaryaction against harasser. Userreported increased confidence in usinglegal systems.

CaseStudy 3:

PropertyDisputeResolutionScenario:FamilydisputeoverancestralpropertyinUttarPradesh,withonebrotherattemptingillegalsale.AadhikarInteraction:Userquery (inHindi):"म`राभाईपैतृकसंपत्तिब`चनाचाहताहै,मैंक्याकरं?“ Systemidentified:PropertyrightsunderHinduSuccessionActResponse provided:Explanationofcoparcenaryrightsunder2005amendmentRequired documentstoprove ownership Process for obtaining injunction from court Legal notice format for warning against sale List of required evidence Estimated timeline and costs Outcome: User obtained stay order preventingillegalsaleandinitiated partition proceedings Familyreportedsaving approximately₹50,000ininitiallegal consultation fees.

G. Performance Evaluation

ADHIKARChatbot:WelcomeScreenandLegalQueryResponse

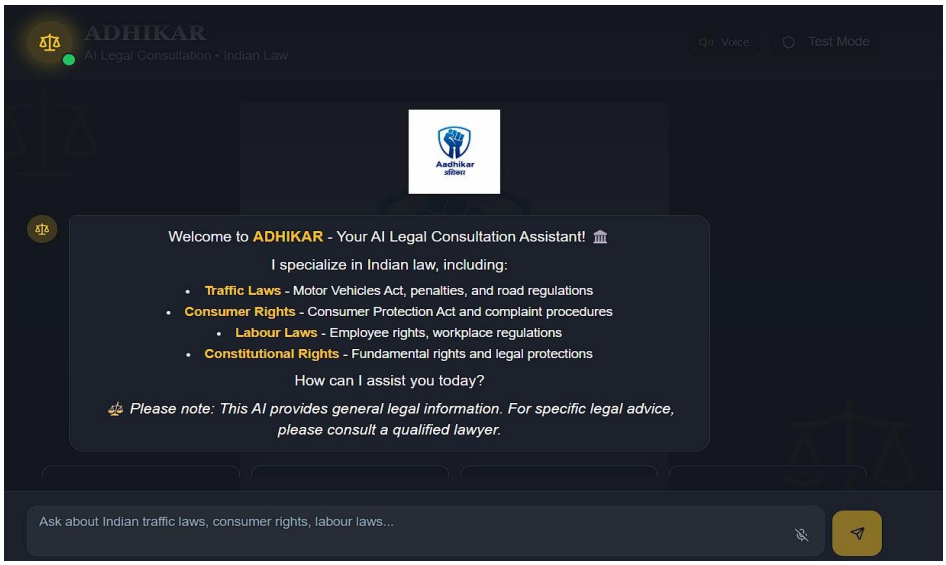

Figure4.6.1ADHIKAR -AILegalConsultation-IndianLawWelcomeScreen

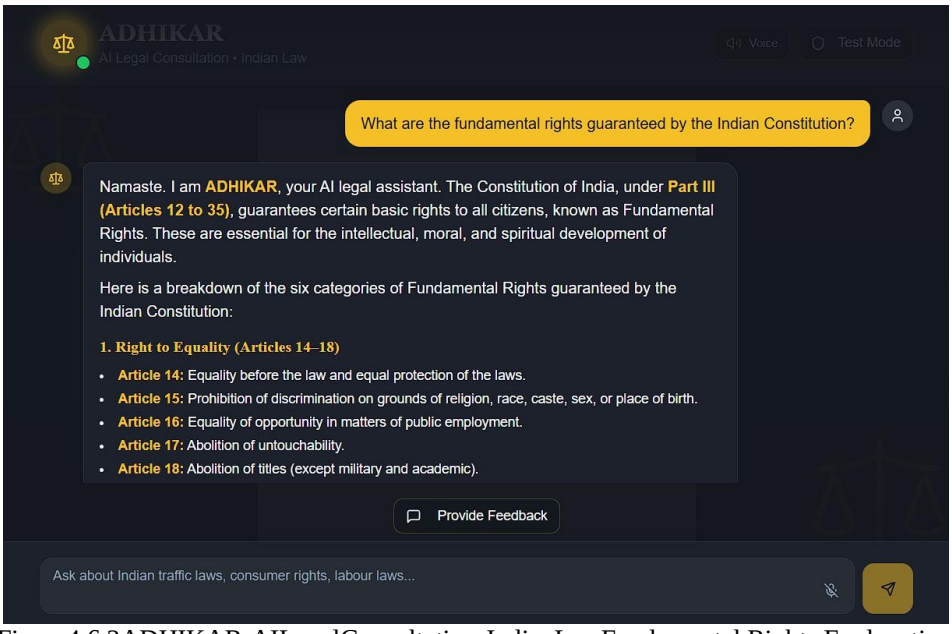

Figure4.6.2ADHIKAR-AILegalConsultation-IndianLawFundamental Rights Explanation

VIII. FUTURE SCOPE

1) ImmediateEnhancements(Next6-12Months)

- Regional LanguageExpansion:ImplementationofTamil, Telugu, Marathi, Bengali, and Gujarati interfacesusingtransfer learning fromexistingHindi models
- VoiceInterfaceEnhancement:ImprovedspeechrecognitionforIndianaccents and dialects with offline capability
- DocumentAnalysisModule:AI-poweredanalysisofuploadedlegaldocuments with automatic extraction ofkey clauses and obligations
- Integration with GovernmentPortals: DirectAPI integrationwith e-Courts, Consumer Forum portals, and legal aid service directories

2) Medium-TermDevelopments(1-3Years)

- PredictiveLegalAnalytics:Usinganonymizeddatatoidentifylegaltrends, common issuesbyregion, and effectiveness ofdifferent legal approaches
- Personalized Legal Education: Adaptive learning paths based on user's legal knowledge level, interests, andfrequently encountered issues
- BlockchainIntegration:Forsecuredocumentverification,smartcontractsfor simple agreements, and immutable record-keeping
- AR/VRInterfaces:Immersiveexperiencesforexplaininglegalproceduresand court processes
- CollaborativeFeatures:Peersupportnetworks,communitylegalexperts,andgroupconsultationcapabilities

3) Long-TermVision(3-5Years)

- Comprehensive LegalCompanion: Evolution into a full legallifecyclemanagement tool from rights awareness to dispute resolution
- AI-LawyerCollaborationPlatform:SeamlesshandoffbetweenAIguidanceand human lawyers with shared context and documentation
- PolicyImpactAnalysis:Usingaggregatedanonymizeddatatoidentifysystemic legal issues and inform policy reform
- Global Adaptation Framework: Methodology for adapting the system to other developing countrycontextswithsimilarjusticegaps

4) ResearchDirections

- ExplainableAIforLegalDecisions:Developing methodstomakeAIlegal reasoning more transparent and auditable
- Cross-lingualLegalTransferLearning:Techniquesfor applyinglegalknowledge across different languages with minimal parallel data
- EthicalAI Frameworks:Developingguidelinesfor AI in legalcontexts addressing bias, fairness, and accountability
- Human-AICollaborationModels:OptimaldivisionoflaborbetweenAIsystems and humanlegalprofessionals

5) ImplementationRoadmap

Table5.1:FutureScopeImplementationTimeline

Phase	Timeline	KeyDeliverables	SuccessMetrics
Phase1	6Months	egionallanguages, Document upload	increasein user base
Phase2	12Months	Predictiveanalytics, Governmentintegration	etention rate
Phase3	24Months	AR/VRinterfaces, Blockchainfeatures	onactive users
Phase4	36Months	llegallifecycle management	Measurableimpact onlegaloutcomes

6) SocietalImpactGoals

- LegalLiteracyTarget:Contributetoincreasinglegalliteracyfromcurrent30%to50% among users within 3 years
- Access to Justice: Reduce the justice gap byproviding free initial guidance to 10 million users within 5 years
- Economic Impact: Save users an estimated ₹500 crores in legal consultation fees over 5 years
- Policy Influence: Usedata insights to inform at least 5 policy reforms addressing common legal issues

7) SustainabilityModel

Toensurelong-termviability,severalsustainabilityapproacheswillbeexplored:

- Public-PrivatePartnership:Collaborationwithgovernmentlegalaidauthorities
- EnterpriseVersion:Premiumfeaturesforbusinessesandorganizations
- GrantFunding:Continuedresearchanddevelopmentthroughacademicand philanthropicgrants
- CommunitySupport:Open-sourcecomponentswithcommercialsupportservices

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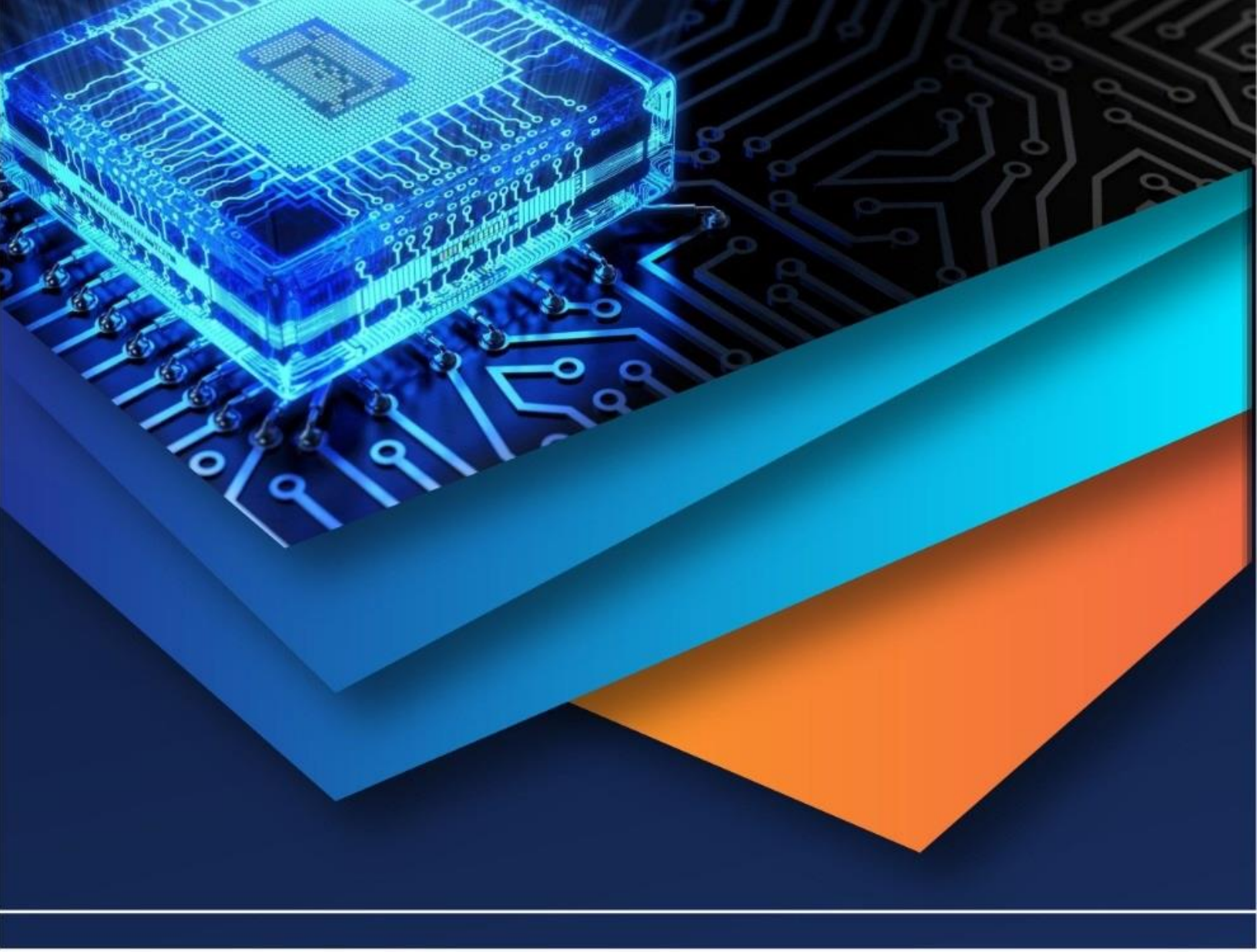

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