

# ONLINE SUBMISSION

TEAM NAME: **CODE BLOODED**

COLLEGE NAME: **CHENNAI INSTITUTE OF TECHNOLOGY**

PROBLEM TRACK: **WOMEN EMPOWERMENT**



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## SYSTEMATIC BARRIERS TO LEGAL EMPOWERMENT FOR WOMEN AND CHILDREN

### The Core Challenge :

While The Indian Constitution and Legal System provides various measures for women and children from workplace to education and protection acts against abuses are remain inaccessible for laypeople. A vast majority of the target people cannot use them due to systemic accessibility gaps because of the complexity of the Indian legal framework. This creates a barrier between the citizens and their constitutional rights.

Legal texts are dense, jargon-filled, and cognitively demanding. For women and children in rural areas with limited literacy, interpreting these complex scenarios without help is nearly impossible.

General-purpose AI tools are unreliable for legal advice due to "hallucinations" (inventing facts). In legal matters, an incorrect response is not just an error—it is dangerous.



Knowledge alone is insufficient; users lack a clear roadmap for application. There is a disconnect between *knowing* the law and the practical steps of filing a complaint or solving a problem legally.

Professional legal counsel is often prohibitively expensive and time-consuming. Victims need an immediate, cost-free, non-judgmental "first responder" to understand their standing before engaging a lawyer.



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# SOLUTION ABSTRACT

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## PROPOSED SOLUTION:

A Retrieval-Augmented Generation (RAG) based edge AI System that lets users query complex legal scenarios while filtering “legal texts” and “hallucinations of generic AI” against verified legal database in offline. It provide a knowledge base in regional language and guide to an actionable solution in legal way. It can be integrated with other applications as chatbots + API integration (Internet).



### RAG System

Verified Legal Database  
Eliminates hallucination risks by retrieving from verified sources



### Voice-to-Text Integration

Speech-Based Access  
Real-time interaction for users with limited literacy



### Offline Accessibility

Quantized AI Models  
Works locally without internet for remote areas



### Legal Verification

Fact-Checking Layer  
Auto-validates against legal statutes and case law



### Smart Legal Navigation

#### Step-by-Step Guidance

Clear roadmap for filing complaints and legal procedures



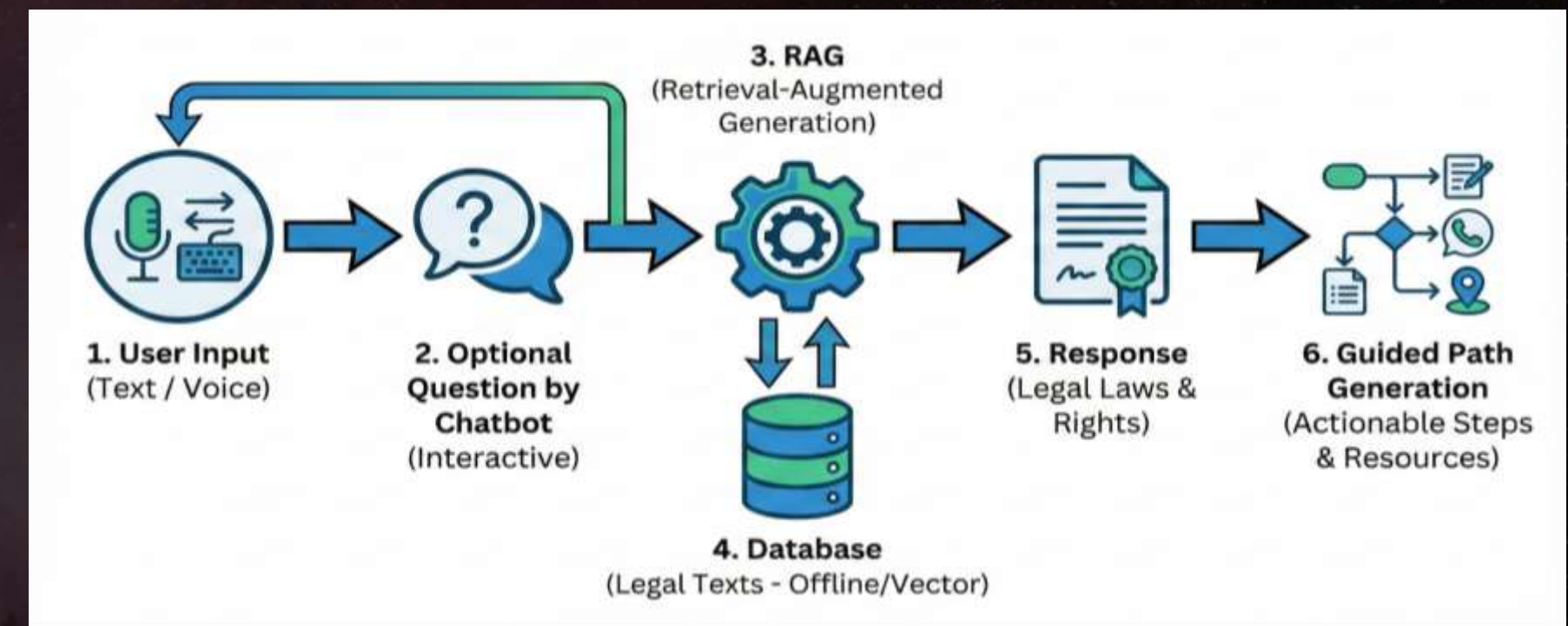
### Multilingual Support

#### Accessibility Across Languages

Support for regional languages ensuring wider reach and inclusion

## PROTOTYPE WORKFLOW:

- User gives queries in either Text or Voice input
- The input data is processed and analysed for more inputs and indexing.
- The LLM of the RAG system retrieves required legal texts from the predefined vector database and generate content
- The final response with a list of legal texts and an guide to future steps to achieve a solution.



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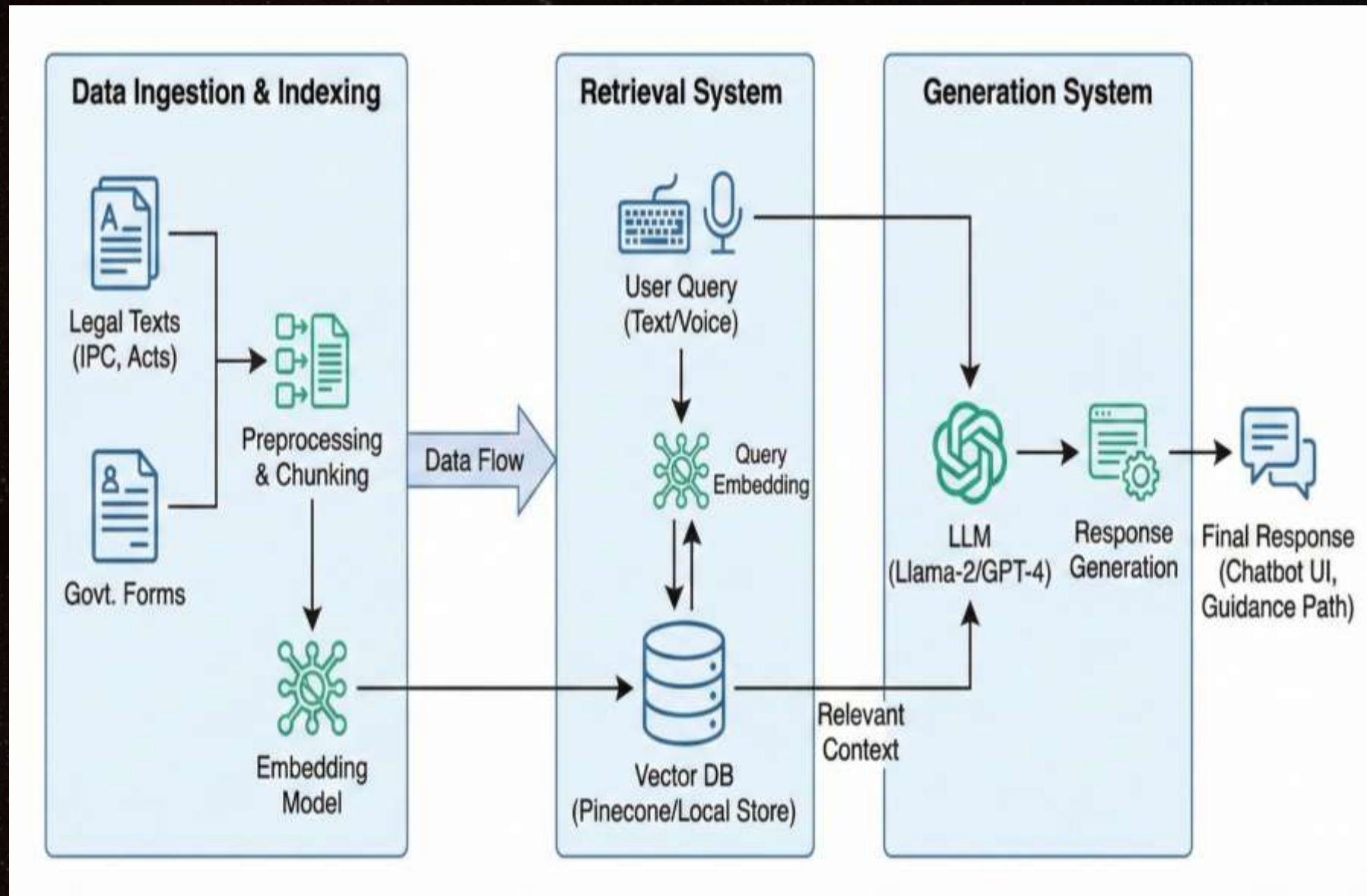


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# ARCHITECTURE AND SYSTEM DESIGN

## RAG SYSTEM ARCHITECTURE



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## CHATBOT - APP



## AI ENGINE



## ACCESSIBILITY



## DATABASE



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# FEASIBILITY AND UNIQUE SELLING POINTS



## Privacy-First Architecture

Quantized LLMs run entirely on-device. Zero cloud connectivity required. User data never leaves the phone. Perfect for sensitive legal matters. No server bills, no tracking, no data breaches. True privacy for vulnerable populations.



## Hallucination-Free Retrieval

Verified Legal Database Integration - RAG architecture filters out AI fabrications.

Every response backed by authentic Indian Constitution, IPC, and CrPC texts. Reduces legal hallucinations from 80% to <5%. No guesswork, only sourced answers.



## Multilingual & Accessible

Supports 22+ Indian scheduled languages including Tamil, Hindi, Bengali, Marathi. Voice input via Whisper API for non-literate users. Regional language legal guidance ensures constitutional rights reach every corner of India, not just English-speaking cities.



## Cost-Zero Sustainability

Built on open-source: Llama2, LangChain, Chroma DB. Zero licensing fees. Modular design allows easy expansion to new languages and laws via JSON updates. Scalable for rural deployment without expensive infrastructure. Maintains operation indefinitely at zero recurring cost.

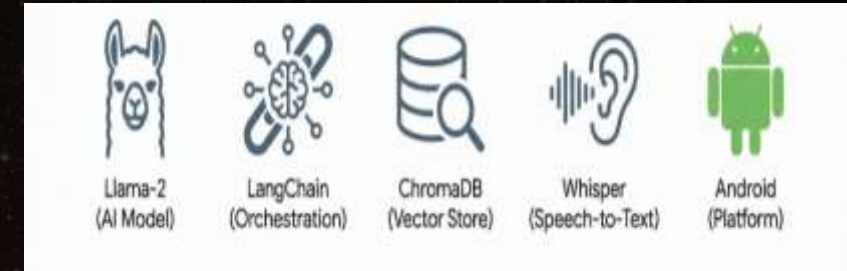
## TECHNICAL READINESS

**Framework:** Langchain + Llama2

**Voice:** Open AI Whisper

**Database:** Chroma DB

**Status:** All technologies are open source and mature



## SUSTAINABILITY & PRIVACY

**Zero Cloud Cost:** Edge computing model eliminates server bills.

**Privacy by Design:** No data leaves the user's phone (Safe for victims).

**Scalable:** Easy to add new language modules (JSON/Vector updates).

## PRODUCT DESIGN

**A Prototype chatbot interface that lets user query via text and voice and retrieve information using quantized LLMs and Vector DB (RAG).**



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# MARKET STUDY AND BUSINESS MODEL

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**TARGET AUDIENCE : WOMEN AND CHILDREN ESPECIALLY FROM RURAL AND SUB-URBAN AREA WITH LIMITED LITERACY AND ACCESSIBILITY**

## Market Analysis

Target Low legal literacy (< 15%)

# 650M

## Women & Children

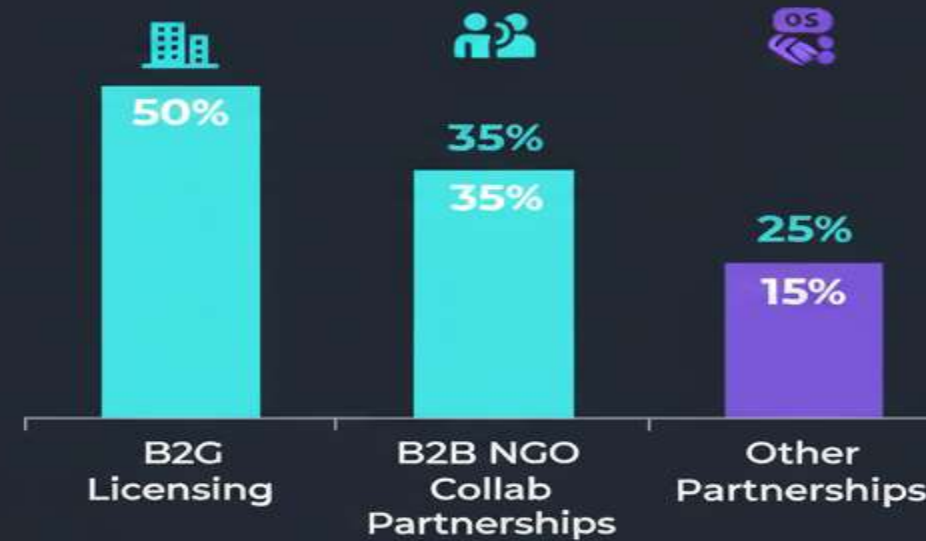
85%

Low Legal Literacy (<15%): Target

↑ Growth: 15% YOO

## Business Model Split

Primary channels for reach



## Cost Structure Efficiency

Avoids propoary costs



## SOCIAL IMPACT

- Provide high level aid to literacy and language limited people.
- Empowers the women and children with their rights and guides them in a legal manner.
- Protects Victims by privacy and non judging first responder
- All Legal laws and rights are accessible to everyone in the country without internet and free of cost.

## FUTURE DEVELOPMENT TIMELINE

- Phase 1 - A Chatbot Prototype with RAG and up to 3 language support
- Phase 2 - OCR Document scanning + 22 Indian scheduled language Integration + API Integration into various govt. applications
- Phase 3 – E-filling Complaints (*Internet*) + govt. partnership



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# RESEARCH AND REFERENCES

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**TITLE :** Legal Query RAG: A Framework for Minimizing Hallucinations

**AUTHOR/SOURCE :** IEEE Xplore (2025)

**LIMITATIONS :** **The Hallucination Problem:** Standard LLMs invent fake laws. This paper proves that a RAG architecture is mandatory (not optional) to reduce "legal hallucinations" from 80% to <5%.

**TITLE :** Agent for Indian Legal Laws: An Agentic & RAG-based Approach

**AUTHOR/SOURCE :** Int. Journal of Advance Research (IJARPR , 2025)

**LIMITATIONS :** **The Context Gap:** Global models (GPT-4) fail at *Indian* laws (IPC/CrPC). This paper highlights the need for a system fine-tuned specifically on the Indian Constitution, which is your core differentiator.

**TITLE :** Enabling On-Device AI for Android: A Dual-Mode System

**AUTHOR/SOURCE :** IJARSCT (2025)

**LIMITATIONS :** **The Connectivity Gap:** Most AI requires the cloud. This research validates the feasibility of using **Quantized LLMs (Llama-RN)** on standard Android phones, proving your "Offline Mode" is technically viable.

**TITLE :** Transforming Legal Aid in India: Can AI Bridge the Justice Divide?

**AUTHOR/SOURCE :** ResearchGate / Dhani et al.

**LIMITATIONS :** **The Accessibility Gap:** Legal aid is too expensive and English-centric. This paper argues that only an AI system with **vernacular support** (like your Tamil/Hindi feature) can truly democratize justice in rural India.



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# TEAM DETAILS

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ROLE	NAME	STREAM / DEPT	YEAR	COLLEGE
TEAM LEADER	JEEVA PRIYAN R	CSE	II	CIT CHENNAI
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