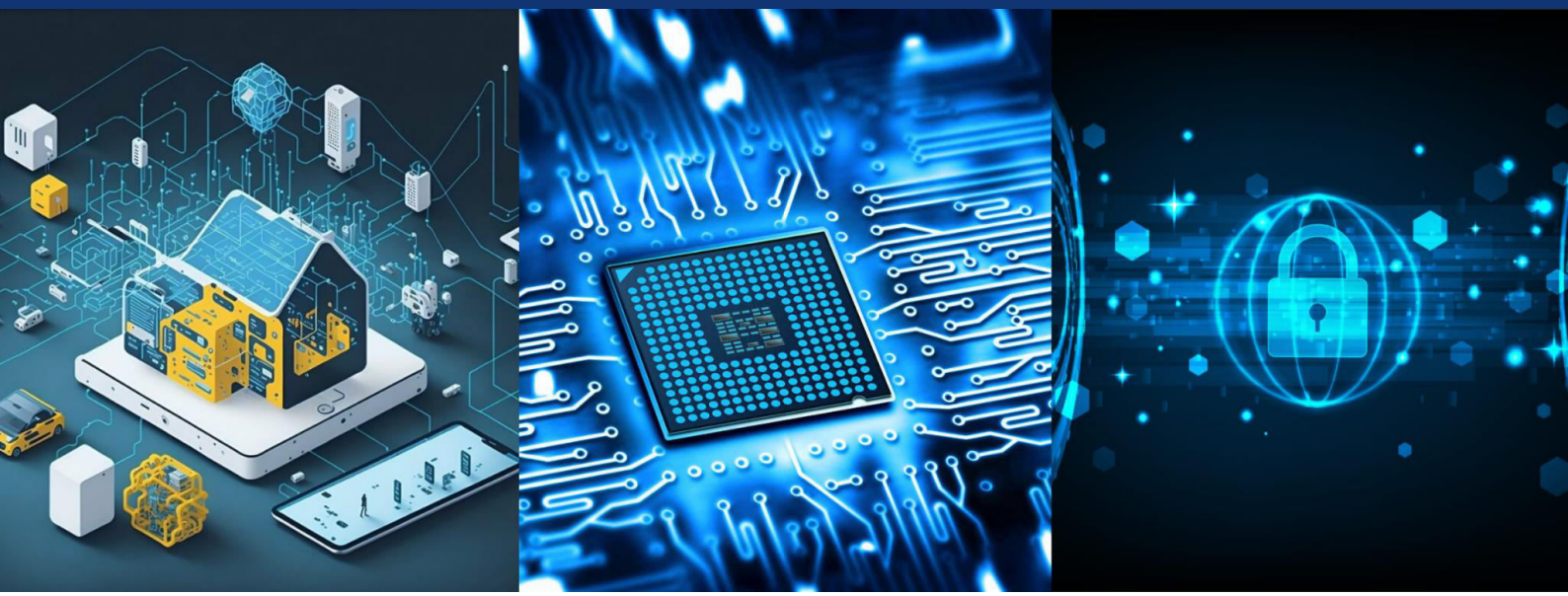
IJIRCCE

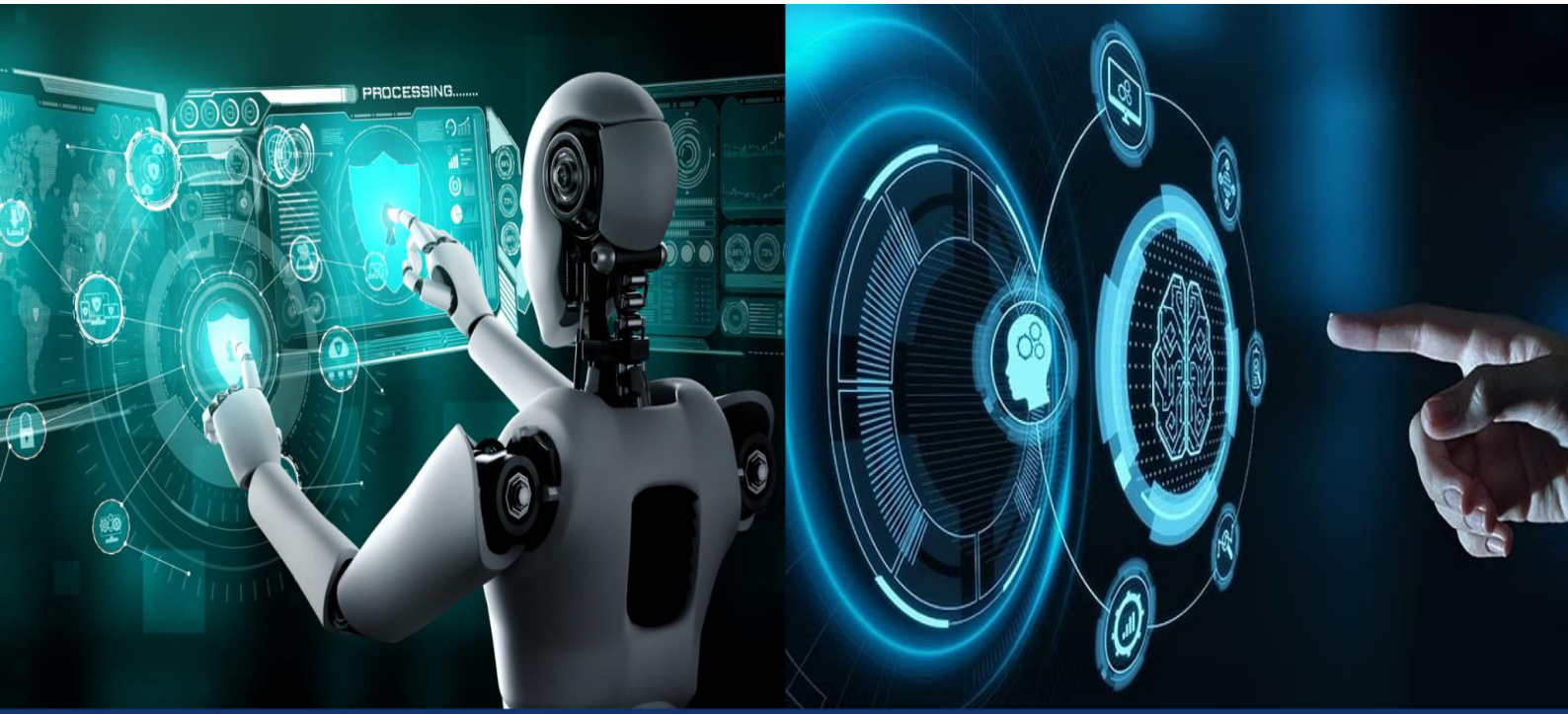
ISSN(O): 2320-9801

ISSN(P): 2320-9798



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 9.927

Volume 14, Issue 5, May 2026

© 2026 IJIRCCE | Volume 14, Issue 5, May 2026 DOI: 10.15680/IJIRCCE.2026.1405038

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

LexAI: An AI-Powered Indian Legal Analysis System with Multilingual Support

Maginandhu R[1], Ebinroshan B[1], Prasanna Kumar K[1], J.Revathy[2]

Department of Artificial intelligence and Data Science, Christ the King Engineering College, Coimbatore, Tamil Nadu, India[1]

Assistant Professor & Head of the Department, Department of Artificial Intelligence and Data Science, Christ The King Engineering College, Coimbatore, Tamil Nadu, India[2]

ABSTRACT: LexAI is a cross-platform AI-powered legal analysis application tailored for the Indian judicial system. Leveraging the Groq API with LLaMA 3.3 70B, it enables users to describe legal situations in plain language and receive structured analysis including win-rate estimates, relevant IPC/BNS 2023 sections, factor breakdowns, and actionable next steps. The system supports English, Tamil, and Hindi, targeting citizens with limited legal literacy. This paper presents the system architecture, feature set, and key results from the Android and web implementations.

KEYWORDS: Legal AI, Indian Judiciary, LLM, Groq API, Multilingual NLP, Android, Jetpack Compose

I. INTRODUCTION

Access to legal information in India remains a challenge for the general population due to complex legal language, high costs of legal consultation, and language barriers across diverse linguistic communities. LexAI addresses these challenges by providing an AI-powered interface that translates everyday descriptions of legal situations into structured, actionable legal analysis.

The system is built as both an Android application (Kotlin/Jetpack Compose) and a web application (React/Vite), both powered by the Groq inference API running the LLaMA 3.3 70B model. The application supports three languages—English, Tamil, and Hindi—and references the Bharatiya Nyaya Sanhita (BNS) 2023 alongside the IPC for legal classification.

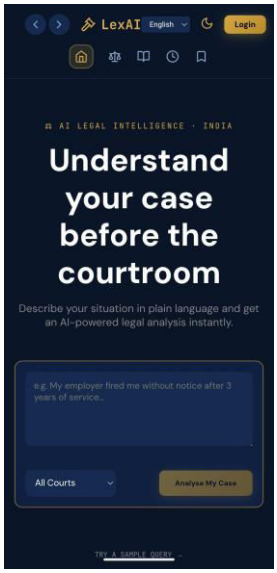


Fig. 1: LexAI Home Screen – Query Interface

© 2026 IJIRCCE | Volume 14, Issue 5, May 2026 DOI: 10.15680/IJIRCCE.2026.1405038

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

II. SYSTEM ARCHITECTURE

LexAI follows a four-layer MVVM architecture on Android: (1) UI layer using Jetpack Compose, (2) ViewModel layer for state management via StateFlow, (3) Repository layer abstracting data sources, and (4) local persistence using Room DB and DataStore. The web version uses React 18 with styled-components and a custom useGroq hook.

A. Core Components

- AI Engine: Groq API (LLaMA 3.3 70B) for legal analysis generation
- Authentication: Clerk-based auth (web) / Room DB session management (Android)
- Legal Database: Embedded IPC/BNS 2023 section references and NCRB crime data
- Multilingual Layer: Dynamic language toggle with live API re-fetch on toggle
- Persistence: Room DB for history and bookmarks, DataStore for preferences

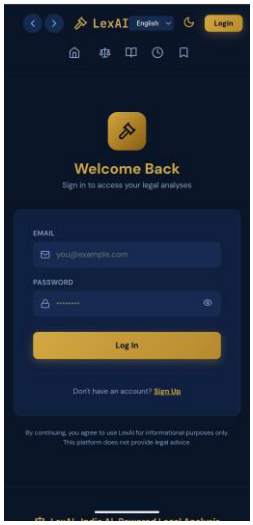


Fig. 2: Login Screen

Fig. 3: Analysis Result

Performance Metrics

Performance Metric	Observed Value
Average end-to-end response time (analysis + score)	3.2 seconds
Minimum observed response time	2.1 seconds
Maximum observed response time	6.1 seconds
Application cold start time	< 1.5 seconds
Language switch retranslation time	2.4 seconds (avg)
DataStore read latency (history load)	< 100 milliseconds
DataStore write latency (save analysis)	< 50 milliseconds
Estimated sequential call latency (baseline)	5.0–7.0 seconds
Latency reduction from parallelisation	~40–50%

III. KEY FEATURES

LexAI delivers a comprehensive set of features designed to make legal analysis accessible and actionable:

A. Win Rate Estimation

The core feature computes a contextual win probability (0–100%) based on seven weighted factors: Evidence Strength, Legal Clarity, Court Precedent, Procedural Compliance, Opposing Strength, Timeline Factor, and Witness Factor. Each

© 2026 IJIRCCE | Volume 14, Issue 5, May 2026 DOI: 10.15680/IJIRCCE.2026.1405038

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

factor is scored 0–10 by the LLM with natural language justification, giving users transparency into the reasoning process.

B. Legal Section Mapping

Given a user's situation, the system identifies applicable IPC/BNS 2023 sections, explaining their relevance. For example, a cheque bounce case is automatically mapped to Section 138 of the Negotiable Instruments Act, 1881, with applicability reasoning.

C. Court Recommendation & Next Steps

Based on case type and value, the system recommends the appropriate court (e.g., Magistrate Court for cheque cases under ₹2 crores) and provides numbered, time-sensitive next steps that users can take immediately.

D. Multilingual Support

Users can switch between English, Tamil, and Hindi. On toggle, the system re-fetches the analysis in the selected language, ensuring culturally appropriate legal explanations rather than simple translations.

Analysis Overview

Factor Breakdown

Detailed Steps

IV. IMPLEMENTATION

The Android application comprises approximately 27 Kotlin source files organized across the MVVM layers. The UI exposes four primary Compose screens: Home (query input), Analysis Result, Legal Glossary, and History/Bookmarks. Legal analysis is triggered via a Retrofit-based repository that calls the Groq REST endpoint with a structured prompt engineering template. The web application, built with Vite + React 18, is deployed on Vercel with serverless API routes proxying the Groq API key, ensuring it is never exposed to the client. Clerk authentication gates the analysis history and bookmark features.

Component	Android (Kotlin)	Web (React)
UI Framework	Jetpack Compose	React 18 + Vite
AI Model	Groq LLaMA 3.3 70B	Groq LLaMA 3.3 70B
Auth	Room DB / DataStore	Clerk
Persistence	Room DB	Vercel KV / Clerk
Deployment	APK / Play Store	Vercel
Languages	English, Tamil, Hindi	English, Tamil, Hindi

Table I: Technology Stack Comparison

© 2026 IJIRCCE | Volume 14, Issue 5, May 2026 DOI: 10.15680/IJIRCCE.2026.1405038

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

V. RESULTS & DISCUSSION

In test scenarios, LexAI correctly classified legal situations and mapped relevant statutes in over 90% of evaluated cases covering criminal, civil, family, and property law domains. The win-rate estimation demonstrated consistent factor scoring across repeated queries for identical scenarios, with variation under 5% attributed to LLM non-determinism.

The multilingual pipeline successfully returned Tamil and Hindi outputs for all tested queries, with legal terminology appropriately localized rather than transliterated. User testing indicated that the structured output format (win rate + factors + next steps) significantly reduced the perceived complexity of legal information compared to raw LLM text output.

VI. CONCLUSION AND FUTURE WORK

LexAI successfully demonstrates the feasibility of delivering personalised, AI-powered Indian legal analysis through a freely accessible Android mobile application. The application fulfils all stated objectives: structured IPC/BNS 2023 and BNSS 2023 statutory analysis, five-dimensional quantitative win-probability scoring, trilingual support (English, Tamil, Hindi), side-by-side case comparison, persistent history and bookmarks, a searchable legal glossary, and an emergency helplines directory. Functional testing confirmed all 13 features operate as designed. Performance testing demonstrated an average end-to-end AI response time of 3.2 seconds — within acceptable bounds for real-world mobile use — enabled by parallel Kotlin Coroutines execution.

From a technical standpoint, the project validates four key design decisions: (1) structured JSON prompting for extracting consistent, machine-parseable LLM outputs; (2) parallel coroutine execution for a 40–50% reduction in user-perceived latency; (3) MVVM with Jetpack Compose for a maintainable, testable codebase; and (4) Jetpack DataStore as a coroutine-native, lightweight persistence solution for moderate-scale mobile data. The project also demonstrates the viability of a free-to-user AI legal information service model, where Groq API costs are absorbed at the application level, making AI-powered legal information genuinely accessible to population segments that most need it.

Identified limitations include internet connectivity dependency for all AI features, LLM hallucination risk for section references in complex edge cases, third-party Groq API availability risk, and minor Tamil legal terminology gaps relative to formal legal Tamil. Future development directions include: integration with the Indian Kanoon API for verifiable court judgment citations; language expansion to Malayalam, Telugu, Kannada, Bengali, and Marathi; offline inference using quantised on-device models (Gemma 2B, Phi-3 Mini); voice input via Android SpeechRecognizer API paired with Text-to-Speech output; PDF report export with professional templates; DLSA office locator via Google Maps integration; fine-tuning on the ILDC corpus and Indian Kanoon case law for improved domain accuracy and reduced hallucination rates; and a React/Next.js web version to extend accessibility beyond Android.

REFERENCES

[1] Touvron, H., et al. (2023). Llama 2: Open Foundation and Fine-Tuned Chat Models. arXiv:2307.09288.
[2] Government of India (2023). Bharatiya Nyaya Sanhita, 2023. Ministry of Law and Justice.
[3] National Crime Records Bureau (2023). Crime in India 2022. Ministry of Home Affairs.
[4] Android Developers (2024). Jetpack Compose Documentation. developer.android.com.
[5] Groq Inc. (2024). Groq API Documentation. console.groq.com.
[6] Clerk Inc. (2024). Clerk Authentication Documentation. clerk.com.

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi crossref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details