Software Specification Requirements

For

<AI Driven legal App-Nyaya Mitra>

Version 1.0

Prepared by: Ajina A(B22CSA11), Devakrishna A S(B22CSA70),
Arshak Muhammed P K(B22CSA72), Sayooj V(B22CSA76)

<T K M College of Engineering>

Date:

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1. Introduction

1.1 Purpose

The AI-Powered Legal Information App is designed to assist law enforcement officers, legal professionals, and citizens by providing instant access to legal provisions, acts, and case laws. By leveraging Artificial Intelligence (AI) and Natural Language Processing (NLP), the system can analyze textual and voicebased inputs to generate relevant legal references. This application aims to bridge the gap between complex legal terminology and practical real-world scenarios, ensuring that users receive accurate and actionable legal insights.

1.2 Scope

The AI-Powered Legal Information App will provide the following functionalities:

- Accept and process user input through both text and voice commands.
- Utilize AI-driven algorithms to suggest relevant legal sections and case laws.
- Enable users to search for legal precedents and landmark judgments.
- Offer real-time updates on legal amendments and court rulings.
- Maintain a secure and scalable database for legal data storage.
- Ensure compliance with global and regional data privacy laws.

This application is intended for law enforcement agencies, legal professionals, and individuals seeking quick legal references. It will be available on mobile and web platforms to ensure maximum accessibility.

1.3 Definitions, Acronyms, and Abbreviations

- **AI**: Artificial Intelligence
- **NLP**: Natural Language Processing
- **OCR**: Optical Character Recognition
- **API**: Application Programming Interface
- **HTTPS**: Hypertext Transfer Protocol Secure
- **GDPR**: General Data Protection Regulation

1.4 References

- Indian Penal Code (IPC)
- Supreme Court and High Court Legal Databases
- Firebase API Documentation
- Google Cloud Security Guidelines
- Bharatiya Nyaya Sanhita (BNS)
- Google Gemini API Docs
- ML Kit Docs
- Speech-to-Text API Docs
- Flutter Docs
- News API Docs
- RESTful API Docs
- GitHub Docs

1.5 Overview

This document outlines the functional and non-functional requirements of the system, along with its architectural design, security considerations, deployment strategies, and future enhancements.

2. Overall Description

2.1 Product Perspective

The AI-Powered Legal Information App functions as a standalone system, integrating with multiple APIs and databases to provide AI-driven legal assistance. The app will operate across multiple platforms, including web and mobile applications, ensuring ease of access for users. The backend will be hosted on a cloud-based infrastructure, allowing for seamless scalability and performance optimization.

2.2 Product Features

- **Real-Time Legal Recommendations:** AI models analyze user inputs and suggest applicable legal sections.
- **Voice and Text Input Support:** Users can either type or speak queries for legal assistance.
- **Case Law Search:** Enables users to look up landmark judgments and legal precedents.
- **Legal Updates Feed:** Displays real-time notifications on legal amendments and court rulings.
- **User Authentication & Security:** Ensures secure login and access control through Firebase Authentication.
- **Image Support:** Users can use image for legal assistance

2.3 User Characteristics

- **Law Enforcement Officers:** Require quick legal references during investigations.
- **Legal Professionals:** Use the app to search case laws and legal sections.
- **General Public:** Individuals seeking knowledge about their legal rights.

2.4 Constraints

- Dependence on internet connectivity for AI model processing.
- Legal databases must be updated regularly for accuracy.
- Must comply with data protection regulations such as GDPR and IT Act, 2000.

2.5 Assumptions and Dependencies

- Users have access to an internet connection.
- Legal datasets are well-maintained and periodically updated.

3. External Interface Requirements

3.1 User Interfaces (UI)

The application will feature an intuitive and user-friendly interface with: •

Home screen showing latest legal news and court rulings

- **Voice recognition capabilities** for hands-free operation.
- **Text ,image and voice** input is available

3.2 Hardware Interfaces

- Compatible with smartphones (Android & iOS), tablets, and desktops.
- Requires devices with at least 2GB RAM and 4GB of free storage.
- Microphone access for voice input functionality.

3.3 Software Interfaces

- **Google Cloud Services**: For hosting and AI model execution.
- **Firebase Firestore**: For structured legal data storage.
- **Gemini API**: For NLP-based text processing and query analysis.
- **Google Speech-to-Text API**: For converting voice input into structured text.

3.4 Communication Interfaces

- **HTTPS Protocol**: Ensures secure data transmission.
- **REST APIs**: Facilitate integration with external legal databases.
- **Push Notifications**: Inform users about legal updates.

3.5 Database Interfaces

- **Elastic search** for quick and efficient legal case search.

4. Functional Requirements

4.1 Real-Time NLP Analysis

- The system will process user queries using NLP to extract relevant legal terms and recommend applicable laws.

4.2 Database Management

- Legal data, user queries, and search logs will be stored in a structured NoSQL database for easy retrieval.

4.3 Logging and Auditing

- Every user action will be logged for security monitoring and future model improvement.

5. Non-Functional Requirements

5.1 Performance

- The system must respond to user queries within **2 seconds**.

5.2 Security

- AES-256 encryption will be implemented for data storage security.
- Role-based access control will restrict unauthorized usage.

5.3 Scalability

- The application will be hosted on cloud infrastructure to support **100,000+ concurrent users**.

5.4 Reliability

- **99.9% uptime** will be ensured through a fault-tolerant cloud architecture.

6. Constraints and Challenges

6.1 Data Privacy

- Compliance with **GDPR** and **Indian IT Act** for user data protection.

6.2 Real-Time Performance

- AI models should handle multiple queries simultaneously without latency.

6.3 Legal Dataset Availability

- The app must maintain an up-to-date legal database for accuracy.

7. Security Considerations

- User Authentication: Firebase Authentication ensures secure logins and provides multi-factor authentication (MFA) for additional security.
- Data Encryption: SSL encryption for secure data transmission, ensuring that sensitive legal information remains protected.
- Role-Based Access Control: Restricts user permissions based on predefined roles such as admin, officer, and general user.
- Audit Logging: Tracks user actions, such as search history and data modifications, for accountability and security monitoring.
- Intrusion Detection System (IDS): Detects potential security threats and unauthorized access attempts.

8. Deployment & Maintenance

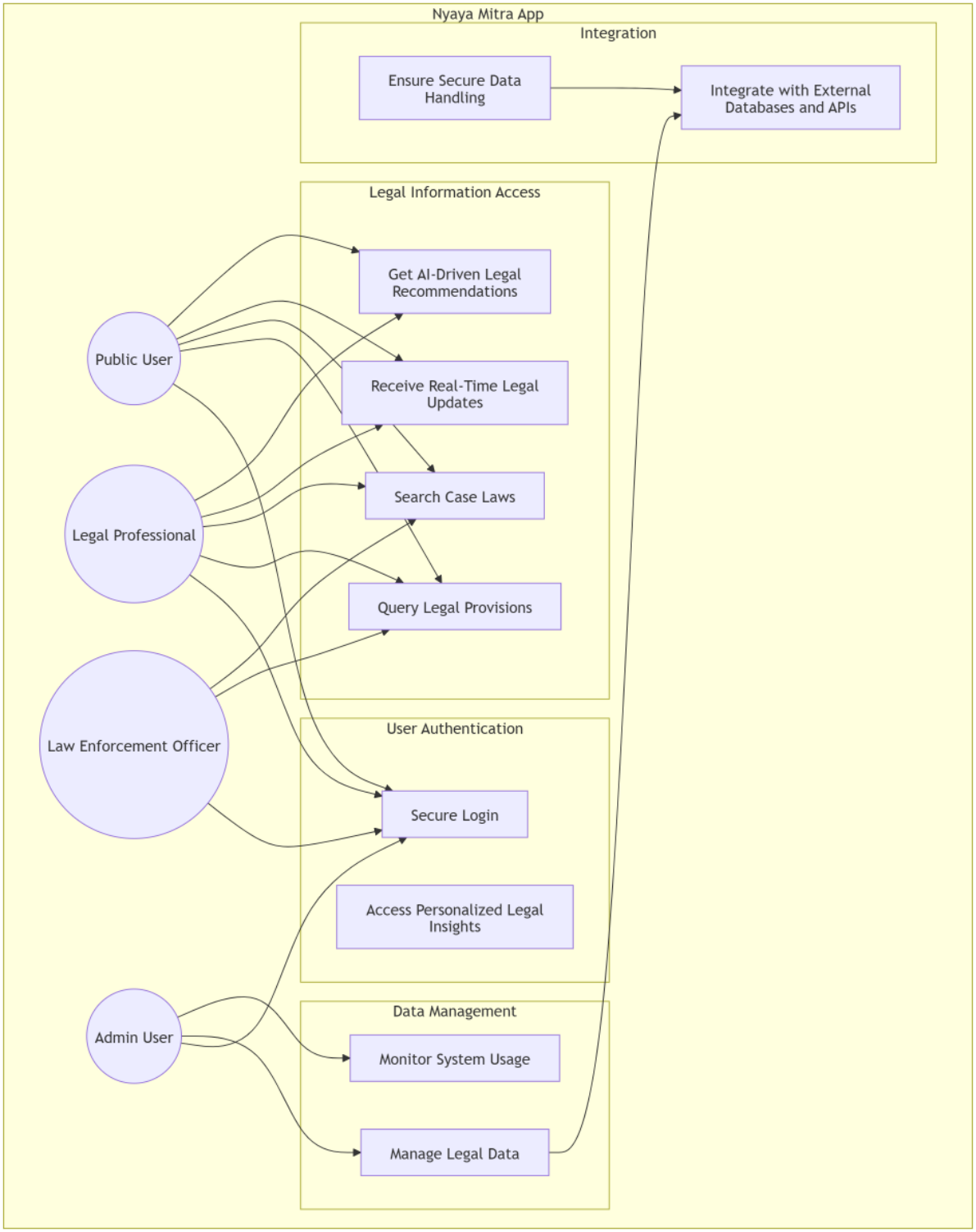
- Hosting: Google Cloud Platform (GCP) for scalability, ensuring reliable uptime and load balancing.
- CI/CD: Automated deployment using GitHub Actions for seamless updates and bug fixes.
- Monitoring: Logs and analytics for issue tracking, leveraging tools like Firebase Performance Monitoring and Google Cloud Logging.
- Backup Strategy: Regular database backups to prevent data loss, utilizing automated scheduled backups with disaster recovery mechanisms.
- Server Scaling: Auto-scaling configurations to handle peak loads efficiently.

9. Future Enhancements

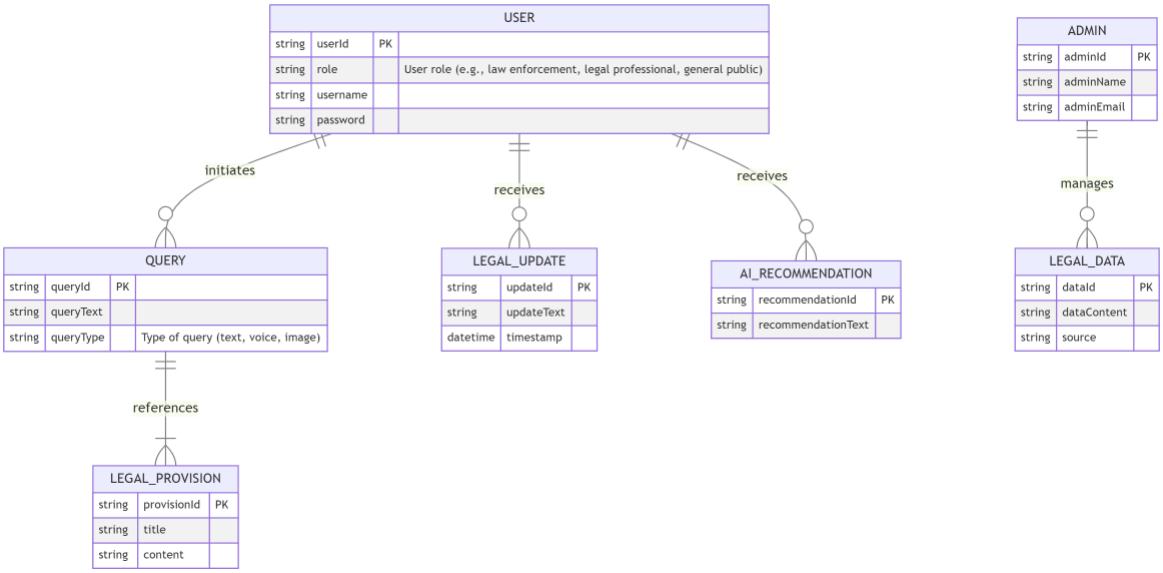
- Multi-language legal support: Implement NLP models that support multiple languages for broader accessibility.
- Integration with legal advisors for real-time guidance: A feature where users can chat with human legal experts for further clarification.
- Offline access to legal articles: A caching mechanism to allow users to access certain legal information without internet connectivity.
- AI-powered chatbot for quick legal consultation: AI-driven chat assistance that provides instant legal references based on queries.
- Blockchain-based legal documentation verification: Using blockchain technology to validate and timestamp legal documents for authenticity.
- Predictive Legal Analytics: AI-based prediction models to suggest possible legal case outcomes based on historical data.

10.System Models

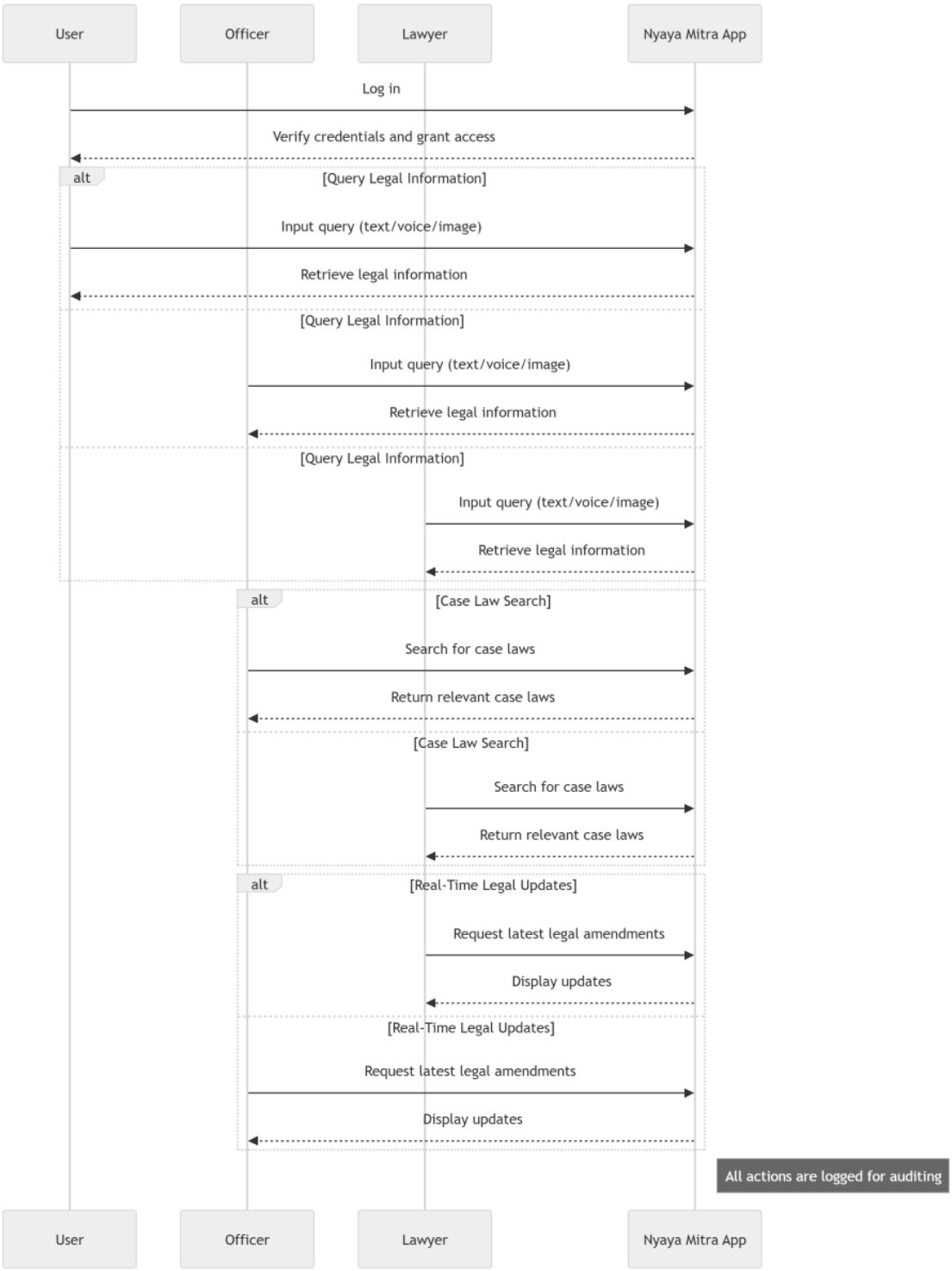
10.1.Use case diagram



10.2 ER Diagram



10.3 Sequence diagram



11. Appendices

Appendix A: Glossary

- **AI**: Artificial Intelligence – The simulation of human intelligence processes by machines.

- **NLP**: Natural Language Processing – A field of AI that enables machines to understand and process human language.
- **OCR**: Optical Character Recognition – A technology that converts different types of documents, such as scanned paper documents or images, into editable and searchable text.
- **API**: Application Programming Interface – A set of functions and procedures allowing different software applications to communicate.

Appendix B: Acronyms and Abbreviations

- **HTTPS**: Hypertext Transfer Protocol Secure – A secure version of HTTP, ensuring encrypted communication over a network.
- **GDPR**: General Data Protection Regulation – A regulation in EU law on data protection and privacy.
- **ML**: Machine Learning – A subset of AI that allows systems to learn from data and improve over time.
- **GCP**: Google Cloud Platform – A cloud computing service used for hosting applications.

Appendix C: Sample User Queries and Expected Responses

User Query	**Expected Response**
"What section applies if "Section 420 IPC (Cheating and dishonestly someone is defrauded online?" inducing delivery of property) may apply."	

User Query	**Expected Response**
"What are my rights if my landlord evicts me without notice?"	"Refer to the Rent Control Act, which varies by state. Generally, eviction without notice is not legal."
"Can I file a case for workplace harassment?"	"You can file a case under the POSH (Prevention of Sexual Harassment) Act, 2013."

Appendix D: References and Legal Resources

- Indian Penal Code (IPC), 1860

- Information Technology Act, 2000
- Various High Court and Supreme Court rulings
- Government legal portals

10. Conclusion

The AI-powered legal information app aims to streamline legal research and assistance using AI and NLP. With a secure and scalable architecture, the application will serve law enforcement, legal professionals, and citizens efficiently, ensuring better access to legal knowledge while maintaining security, privacy, and scalability.