

Table of Contents

Topic	Page No.
1. Introduction	4
1.1. Purpose of this Document	4
1.2. Scope of the Development Project	4
1.3. Definitions, Abbreviations, and Acronyms	5
1.4. References	6
1.5. Overview	6
2. Overall Description	7
2.1. Product Perspective	7
2.2. Product Functions	8
2.3. User Characteristics	9
2.4. General Constraints, Assumptions, and Dependencies	10
2.5. Apportioning of Requirements	10
3. Specific Requirements	11

3.1. External Interface Requirements	11
3.2. Detailed Description of Functional Requirements	12
3.3. Performance Requirements	13
3.4. Logical Database Requirements	13
3.5. Security Requirements	13
3.6. Software Quality Attributes	14
4. Change History	14
5. Document Approvers	14

1. Introduction

1.1 Purpose of this Document

This document delineates the comprehensive software requirements for LexIntel AI. It articulates both the functional and non-functional specifications that the development team must adhere to, ensuring that the end product aligns with the client's expectations and the needs of the users it serves. The document will function as a formal agreement between the stakeholders and the development team and serve as a definitive guide for the design and implementation phase. Additionally, it provides a technical foundation for project planning, cost estimation, and scheduling.

1.2 Scope of the Development Project

LexIntel AI is conceived as a multipurpose legal platform, aimed at revolutionizing how legal information, from case details to legal precedents, is accessed and utilized. The system will provide various services including but not limited to:

- **Automated Judgment Conversion:** The LexIntel AI system should be able to automatically convert legal judgments from traditional and scanned formats into digital formats that are compliant with the latest laws and regulations, such as the Bhartiya Nyaya Sanhita. It should utilize Optical Character Recognition (OCR) technology and advanced formatting algorithms to ensure the integrity and readability of converted documents. The system should support multiple output formats, enabling legal professionals and institutions to access, share, and archive legal documents more efficiently. This functionality should streamline document management workflows and aid in the sustainable preservation of legal records.
- **Interactive FIR Lodging:** The software being developed should offer an interactive module for lodging First Information Reports (FIRs), equipped with AI-driven prompts and validations to guide users through the FIR submission process. This module should ensure that all necessary information is accurately captured, significantly reducing the potential for errors and omissions. The design of this module should prioritize security and confidentiality, safeguarding sensitive information throughout the process. The system should aim to improve the quality of FIRs lodged and facilitate the swift initiation of legal proceedings.
- **Dynamic Lawyer Matchmaking:** The system should provide a dynamic lawyer matchmaking service, capable of connecting clients with legal representative based on specified criteria such as area of expertise, location, language preferences, and availability. This service should leverage a sophisticated algorithm to match client requirements with lawyer profiles, ensuring a high degree of relevancy and compatibility. The system should offer communication tools and scheduling features to streamline the initial consultation process. This module should enhance the accessibility of legal services, enabling clients to find suitable legal representation with ease.

- **Comprehensive Court Information:** The portal should include a module that presents detailed information on court locations, hours of operation, and recent judgments. It should integrate an interactive map interface and utilize AI-driven chatbots for quick queries about court-related information. The system should aggregate and update this information in real-time, ensuring that users have access to accurate and current data. This module should serve as a valuable resource for legal professionals, clients, and the general public, facilitating informed decision-making and planning.
- **Efficient Case Scheduling:** The LexIntel AI system should manage court schedules with a visually guided interface, supported by a robust notification system to alert involved parties of upcoming events or changes. The system should allow for easy drag-and-drop functionality for rescheduling, ensuring flexibility and efficiency in case management. It should integrate color-coded priority levels for scheduled cases, enabling court administrators to prioritize and organize cases effectively. This functionality should streamline court operations, enhancing the overall efficiency of the legal process.

The project's scope includes the development of a scalable platform with robust, secure, and user-friendly modules that can be extended and integrated with other systems as needed.

1.3 Definitions, Abbreviations, and Acronyms

To ensure clarity and avoid ambiguity, this subsection provides definitions for terms, abbreviations, and acronyms used throughout this SRS document:

AI (Artificial Intelligence)	The simulation of human intelligence processes by machines, especially computer systems.
FIR (First Information Report)	A written document prepared by police organizations in countries like India and Bangladesh when they receive information about the commission of a cognizable offense.
IPC (Indian Penal Code)	The official criminal code of India, intended to cover all substantive aspects of criminal law.
LLM (Large Language Model)	It is based architecture for mapping the previous judgements with the new criminal bills
RAG (RetrievalAugmented Generation)	By fine-tuning open-source Large Language Models using Retrieval Augmented Generation we can achieve this goal.

CrPC (Code of Criminal Procedure)	The main legislation on the procedure for administration of substantive criminal law in India.
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Further terms will be defined as they appear in the context of the document.

1.4 References

A list of all documents, articles, and other sources of information referenced in the compilation of this SRS, including:

1. AI Definition. Link: <https://www.ibm.com/topics/artificial-intelligence>
2. FIR (First Information Report). Link: <https://www.humanrightsinitiative.org/publications/police/fir.pdf>
3. IPC (Indian Penal Code). Link: https://www.indiacode.nic.in/handle/123456789/2263?sam_handle=123456789/1362
4. LLM (Large Language Model). Link: https://en.wikipedia.org/wiki/Large_language_model
5. RAG (RetrievalAugmented Generation). Link: <https://research.ibm.com/blog/retrieval-augmented-generation-RAG>
6. CrPC (Code of Criminal Procedure). Link: https://www.indiacode.nic.in/handle/123456789/16225?sam_handle=123456789/1362

1.5 Overview

The document is structured to elaborate on the overall description and specific requirements of LexIntel AI. Subsequent sections of the document will address the product perspective, product functions, user characteristics, constraints, and assumptions. The requirements presented will be partitioned appropriately to ensure a clear understanding of the system's functionality, interactions, performance metrics, and quality. General description of the project is discussed in section 2 of this document. Section 2 gives the functional requirements, data requirements and constraints and assumptions made while designing the multi-utility system. It also gives the user viewpoint of product use. Section 3 gives the specific requirements of the product. Section 3.0 also discusses the external interface requirements and gives detailed description of functional requirements. The closing sections will maintain a record of the evolving nature of this SRS through change history logs and will list the stakeholders responsible for the approval of this document.

2. Overall Description

This section provides a thorough overview of LexIntel AI, setting the stage for a comprehensive understanding of the platform's integration into the existing legal framework and its operational ecosystem. The aim is to

establish a broad yet detailed context in which the system will function, the nature of its interactions, and the scope of its capabilities.

2.1 Product Perspective

LexIntel AI positions itself as an auxiliary component within the larger legal infrastructure. It operates in tandem with other judicial and law enforcement systems, complementing them by providing AI-driven enhancements to their processes.

System Interfaces:

- **Database Interface:** Connects with national and international legal databases for sourcing judicial records and statutes.
- **Courtroom Technology Interface:** Interfaces with digital court recording systems and electronic case filing systems to streamline judicial processes.
- **Law Practice Management Systems:** Integrates with tools used by law firms for case management, billing, and client communications.

User Interfaces:

- **Client Portal:** A secure and personalized dashboard that allows clients to initiate FIRs, search for lawyers, and view case schedules.
- **Lawyer Dashboard:** A specialized interface for legal professionals to manage cases, access law databases, and interact with clients and court officials.
- **Administrative Console:** Used by court administrators for scheduling, reporting, and system configuration.

Hardware Interfaces:

- Requires basic compatibility with courtroom audio-visual equipment for displaying case schedules and streaming court proceedings.

Software Interfaces:

- **Authentication Service:** Interfaces with OAuth providers for secure user authentication.
- **Notification Service:** Leverages email and SMS gateway APIs for delivering system notifications.

Communications Interfaces:

- Utilizes HTTPS and WebSocket protocols for secure and real-time communication between clients and servers.

Memory Constraints:

- Optimized for minimal on-device storage utilization, leveraging cloud storage solutions for data management.

Operations:

- Provides 24/7 access to public legal information while ensuring the confidentiality of ongoing cases and client-lawyer communications.

2.2 Product Functions

The following delineates the specific functionalities provided by the various modules within LexIntel AI:

Judgment Conversion Module

Functionality: The Judgment Conversion Module should implement text recognition and format transformation algorithms to convert scanned documents into editable formats. It should be capable of recognizing and accurately converting legal texts from various sources and formats, including PDFs and images, into digitally accessible formats like DOCX or HTML.

Objective: This module should aim to streamline the process of digitizing legal judgments, making them easily accessible, searchable, and editable. It should ensure the preservation of document fidelity during conversion, maintaining the structure, formatting, and content integrity of the original documents.

FIR Lodging Module

Functionality: The FIR Lodging Module should employ natural language processing to guide users through the FIR filing process, ensuring legal compliance and data integrity. It should provide intelligent prompts and validations to help users input accurate and complete information, reducing the likelihood of errors and omissions.

Objective: This module should facilitate a user-friendly and efficient process for lodging FIRs, making it accessible for individuals regardless of their familiarity with legal procedures. It should also ensure that FIRs are compliant with legal standards and requirements, enhancing the quality of legal documentation and the efficiency of legal proceedings.

Lawyer Match Module

Functionality: The Lawyer Match Module should leverage a sophisticated recommendation engine to match client requirements with lawyer profiles based on historical data and success rates. It should analyze client inputs, such as case type, location preferences, and specific legal needs, to recommend lawyers with matching expertise and experience.

Objective: This module should simplify the process of finding appropriate legal representation, making it easier for clients to connect with lawyers who are well-suited to their legal needs. It should enhance the client experience by providing personalized recommendations, thereby increasing the chances of successful legal outcomes.

Court Information Module

Functionality: The Court Information Module should integrate with geographical information systems to display court locations and utilize data analytics to summarize recent judgment trends. It should provide users with detailed information on court operations, including working hours, contact details, and access to recent judgments and legal resources.

Objective: This module should serve as a comprehensive resource for legal professionals and the public, offering easy access to court information and legal judgments. By providing up-to-date and accurate information, it should facilitate informed decision-making and enhance the accessibility of the legal system.

Case Scheduling Module

Functionality: The Case Scheduling Module should combine calendar synchronization technologies with an AI-driven algorithm to propose optimal hearing dates based on case priority and stakeholder availability. It should allow for easy scheduling, rescheduling, and notification of hearing dates and times, accommodating the complexities and dynamics of court operations.

Objective: This module should streamline the scheduling of legal cases, improving the efficiency and effectiveness of court administration. By optimizing hearing schedules based on case priority and stakeholder availability, it should ensure that legal proceedings are conducted in a timely and orderly manner.

2.3 User Characteristics

Users of LexIntel AI are categorized by their role within the legal ecosystem and by their technical affinity:

- Legal Professionals (High technical affinity): Expected to navigate complex case management and legal research tools.
- Law Enforcement Officials (Moderate technical affinity): Require a balance between user-friendliness and comprehensive reporting capabilities.
- Clients (Variable technical affinity): Range from individuals with minimal exposure to technology to those who are highly adept at using advanced digital platforms.
- Court Administrators (High technical affinity): Need to operate sophisticated scheduling systems and manage extensive databases.
- General Public (Low technical affinity): Access the system for information and services that must be presented in an easy-to-understand format.

2.4 General Constraints, Assumptions and Dependencies

- General Constraints: Dependent on consistent internet service and integration capabilities of third-party legal databases and systems.
- Assumptions: Assumes that users have varying levels of legal knowledge; the system must be equipped with guided processes and informative tooltips.
- Dependencies: Relies on the reliability and accuracy of external data sources for legal content and on the stability of cloud services for storage and processing.

2.5 Apportioning of Requirements

The LexIntel AI system will be released in stages, with each phase focusing on different modules and features:

- Initial Release: Core functionalities such as the Judgment Conversion and FIR Lodging modules will be prioritized.
- Intermediate Release: Enhanced features like advanced lawyer-client matchmaking and richer data analytics for court information.
- Mature Release: Fully-fledged integration with court systems for real-time scheduling and updates, along with a comprehensive suite of AI-assisted legal research tools.

The incremental rollout strategy ensures that each phase is refined based on user feedback and evolving technological landscapes.

3. Specific Requirements

3.1 External Interface Requirements

The external interface requirements delineate the interfaces through which users, hardware, software, and communications interact with LexIntel AI, ensuring a seamless and cohesive user experience.

3.1.1 User Interface Requirements

- **Client Portal:** LexIntel AI will offer a web-based client portal that allows users to perform legal searches, submit documents for conversion, and interact with the chatbot. The portal will be accessible across multiple browsers and devices, ensuring responsive design and cross-platform compatibility.
- **Notification System:** Users will receive notifications through the UI as pop-up messages for real-time updates, and through integrated channels such as email and SMS, based on their preferences set within the system.

3.1.2 Hardware Interface Requirements

- **Compatibility:** The software will be compatible with standardized hardware used in legal settings, such as document scanners for uploading physical documents to the Judgment Conversion Module and courtroom digital signage for the Case Scheduling System.

3.1.3 Software Interface Requirements

- **Integration:** LexIntel AI will interface with various legal databases and practice management systems using RESTful APIs to fetch and post data as required by the user's request or system processes.

3.1.4 Communication Interface Requirements

- **Protocols:** The software will utilize HTTP/HTTPS for web communications, SMTP for email notifications, and GSM for SMS notifications to ensure secure and reliable data transmission.

3.2 Detailed Description of Functional Requirements

Each functional requirement of LexIntel AI is detailed to encompass specific system capabilities, how the system interacts with users, processes data, and yields outputs.

3.2.1 AI-Driven Chatbot Interface (LexiBot)

Purpose	LexiBot will serve as a 24/7 assistant to users, guiding them through the platform, providing legal information, and facilitating various legal processes.
Inputs	Users can input queries in natural language.
Processing	LexiBot will use advanced NLP algorithms to parse queries, retrieve information, or execute actions.
Outputs	LexiBot will present users with information or confirmations of actions taken. Interactions will be logged for quality and training purposes.

3.2.2 Case Scheduling System

Purpose	To automate and streamline the process of scheduling legal cases, with real-time calendar updates and notifications.
Inputs	Data input by court officials regarding trial dates, hearing schedules, and rescheduling requests.
Processing	The system will use scheduling algorithms to optimize court calendar management.
Outputs	A visual calendar interface for court officials and notifications to relevant parties regarding any scheduling changes.

3.2.3 Judgment Conversion Module (JCM)

Purpose	To convert legal judgments from various formats into a standardized format (Bhartiya Nyaya Sanhita) while maintaining the integrity of the content.
Inputs	Scanned documents or digital files of legal judgments.
Processing	The JCM will apply OCR and format translation algorithms to convert documents.
Outputs	Converted legal documents in the desired format, downloadable and ready for e-filing.

3.2.4 Lawyer-Client Connection Portal (LCCP)

Purpose	To match clients with legal representation based on specified criteria and facilitate initial consultations.
Inputs	Client preferences and case details, along with lawyer availability and expertise profiles.
Processing	The LCCP will use a matching algorithm to pair clients with suitable lawyers.
Outputs	A list of lawyer profiles, communication tools for initial consultations, and scheduling features for face-to-face meetings.

3.3 Performance Requirements

Performance requirements ensure that LexIntel AI operates efficiently, providing users with swift, reliable access to its features.

- **System Availability:** LexIntel AI will be available 24/7, with a scheduled downtime only for maintenance communicated in advance to users.
- **Response Time:** All system interactions, including document conversions, chatbot responses, and case updates, will be processed within an acceptable timeframe, not exceeding four seconds under typical load conditions.

3.4 Logical Database Requirements

The logical database requirements outline the structure and rules that the database should adhere to, ensuring data integrity and responsiveness.

- **Schema Design:** The database schema will be optimized for query efficiency, with indexing on frequently accessed fields such as case numbers, user IDs, and document titles.
- **Data Retention:** The system will retain logs and user interactions for a period that complies with legal data retention policies, ensuring the availability of historical data for auditing and reporting purposes.

3.5 Security Requirements

Security requirements are paramount to protect user data and uphold the confidentiality and integrity of legal proceedings.

- **Data Encryption:** All sensitive data, including personal information and legal documents, will be encrypted both at rest and in transit using industry-standard encryption protocols.
- **User Authentication:** Multi-factor authentication will be mandatory for all users, especially for legal professionals and court officials, to ensure secure access to system functionalities.

3.6 Software Quality Attributes

The quality attributes define the standards that the software should meet regarding usability, reliability, and other quality criteria.

- **Reliability:** LexIntel AI will have redundancy mechanisms in place to handle system failures, ensuring high reliability and minimal disruption of service.
- **Usability:** The interface design will prioritize user experience, with consistent navigation patterns, clear labelling, and comprehensive user support documentation.

4. Change History

20240410	Version 1.0 - Initial Release

5. Document Approvers

SRS for CSC based Multi-Utility System (including Access Control and Attendance Monitoring) approved by:

(name)

Designation

Date: