

Project Title: Complete Legal Aid – Legal & Judicial Communication Platform

Course: CSE 3411 – System Analysis and Design Lab

Department: Computer Science and Engineering

Institution: United International University (UIU), Bangladesh

Submission Date: October 2025

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Abstract

Access to justice remains one of the most persistent challenges for citizens in Bangladesh. Complex legal language, lack of awareness, and limited communication between citizens and lawyers have created barriers that discourage people from seeking timely assistance. The **Complete Legal Aid – Legal & Judicial Communication Platform** addresses these challenges by offering a secure, intelligent, and user-friendly system that connects verified lawyers with citizens seeking help.

The platform integrates **AI-powered legal guidance**, a **secure evidence vault**, **real-time consultation booking**, and **case tracking** in both Bangla and English. It ensures that individuals can report incidents, find expert legal support, and manage their legal affairs confidently—all from a single digital platform. By blending social impact with modern technology, the system aims to promote transparency, inclusivity, and digital trust in Bangladesh's legal ecosystem.

Acknowledgement

We express our deepest gratitude to our respected faculty of **United International University** for their guidance and mentorship throughout this project. Their invaluable feedback helped shape the concept, structure, and implementation roadmap of this system.

We also thank the lawyers, students, and general citizens who participated in our surveys and discussions, sharing insights into the real-world challenges of accessing legal aid. Finally, we acknowledge our teamwork, dedication, and shared goal of building a technology-driven, citizen-centric legal communication platform.

1. Introduction

1.1 Purpose

The purpose of this SRS is to define the functional and non-functional requirements of the **Complete Legal Aid – Legal & Judicial Communication Platform**, designed to simplify access to legal services and ensure transparent communication between users and lawyers.

This document will serve as a technical foundation for developers, testers, and stakeholders to understand how the system functions, its design constraints, and quality expectations.

1.2 Scope

The platform enables users to:

- Find and consult verified lawyers.
- Report incidents and track ongoing cases.
- Upload and store sensitive documents in a secure evidence vault.
- Get AI-based legal explanations in Bangla and English.
- Communicate with lawyers and receive updates through notifications.

Lawyers can:

- Manage their cases, appointments, and client communications.
 - Update consultation availability and provide legal guidance.
- Maintain compliance reminders and review client feedback.

Admins can:

- Manage users, cases, and lawyer verification.
- Monitor system activities, access logs, and feature settings.

The system is web-based, mobile-responsive, and designed for national scalability.

1.3 Intended Audience

Audience	Purpose
Developers	To understand the technical requirements and system flow.
Test Engineers	To validate and ensure the requirements meet expected quality.
Project Managers	To plan development milestones and oversee progress.
Lawyers	To manage cases, clients, and appointments.
End Users (Citizens)	To access justice digitally with trust and ease.
Administrators	To ensure data accuracy, security, and smooth operations.

1.4 Problem Statement

In Bangladesh, legal services are often inaccessible due to:

- Lack of reliable information about qualified lawyers.
- Complex and non-transparent legal processes.
- Safety and privacy concerns when sharing evidence.
- No digital record of consultations or case tracking.

Existing solutions are fragmented and fail to offer an all-in-one secure experience.

The **Complete Legal Aid** platform aims to overcome these challenges with verified lawyer listings, case tracking, encrypted document storage, and AI-driven legal support—all in one place.

1.5 Goals and Objectives

1. Build a centralized digital platform for citizens and lawyers.
2. Provide AI-assisted legal information and guidance.
3. Enable secure, real-time lawyer booking and consultation.
4. Implement end-to-end encrypted evidence storage.
5. Allow users to track case progress and receive notifications.
6. Offer a bilingual experience (Bangla & English).

7. Ensure transparency and trust through verified lawyer profiles.

1.6 Out of Scope

- Automated decision-making or legal verdict prediction.
- Integration with government or court systems.
- Payment gateway for billing (reserved for future scope).
- Offline case management.

2. System Overview

2.1 Product Perspective

The platform functions as a **centralized digital hub** connecting lawyers, clients, and administrators. It bridges communication gaps while maintaining privacy and professionalism. It is not intended to replace traditional legal services but to **enhance accessibility and efficiency** through a hybrid digital model (web + mobile).

2.2 Product Functions

Function	Description
User Registration & Login	Users and lawyers register with OTP/email verification.
Lawyer Directory	Search by specialization, experience, and location.
Consultation Booking	Real-time appointment booking and scheduling.
Case Tracking	View case status, progress, and communication history.
AI Legal Assistant	Provides bilingual explanations of legal terms and procedures.
Evidence Vault	Secure upload, encryption, and controlled document sharing.
Notifications	Real-time updates on appointments and case changes.
Feedback & Rating	Allows clients to rate lawyer services post-consultation.
Admin Panel	System monitoring, verification, and analytics management.

2.3 User Classes and Characteristics

User Type	Description	Skill Level
User (Citizen)	Reports incidents, books lawyers, uploads documents.	Basic
Lawyer	Provides consultation, manages clients and cases.	Intermediate
Admin	Verifies accounts, maintains security and analytics.	Advanced

2.4 Operating Environment

- **Platform:** Web and Android application.
- **Backend:** Cloud-hosted RESTful architecture (Node.js / Python).
- **Database:** PostgreSQL / MongoDB.
- **Network:** Minimum 3G connection required.
- **Security:** AES-256 encryption, SSL/TLS protocols, 2FA for lawyers/admins.

2.5 Design and Implementation Constraints

- Must comply with **Bangladesh ICT Act & Data Privacy Rules**.
- Must support **bilingual UI (Bangla + English)**.
- Designed to scale up to **10,000 active users** in MVP.
- No reliance on third-party paid APIs in initial release.

2.6 Assumptions and Dependencies

- Users have smartphones and stable internet connections.
- Lawyers maintain up-to-date availability and information.
- Admins handle verification and security oversight.
- The AI module depends on curated, verified legal content.

2.7 SDLC Approach

The project follows an **Agile Iterative Model**:

1. **Planning:** Identify system goals and survey findings.
2. **Requirement Analysis:** Gather inputs from users and lawyers.

3. **Design:** Create UML diagrams, use cases, and data models.
4. **Development:** Build modules iteratively (AI assistant, booking, evidence vault).
5. **Testing:** Conduct unit, integration, and user acceptance tests.
6. **Deployment:** Launch MVP with secure cloud infrastructure.
7. **Maintenance:** Continuous updates and user feedback integration.

3. Requirements Elicitation & Analysis

3.1 Introduction

This chapter focuses on identifying and analyzing the real-world requirements of the *Complete Legal Aid – Legal & Judicial Communication Platform*. The purpose is to understand user needs, current system limitations, and design a solution that bridges the gap between citizens and legal professionals.

The analysis process included:

- Online surveys conducted with general users and lawyers.
- Observation of existing digital legal services.
- Benchmarking against local and international legal-tech platforms.
- Identifying gaps and finalizing a feature set for the Minimum Viable Product (MVP).

The gathered data helped refine requirements into precise functional and non-functional specifications, ensuring the system remains realistic, user-centric, and socially impactful.

3.2 Information Sources

3.2.1 Internal Sources

- **Survey Data:** Responses collected from 36 citizens and lawyers through Google Forms.
- **Team Brainstorming:** Iterative sessions to align system design with legal, social, and technical feasibility.
- **Feasibility Study:** Technical, operational, and economic evaluation conducted during the planning phase.

3.2.2 External Sources

- **Legal Portals:** Study of platforms like *LegalZoom*, *Justia*, *Avvo*, *LawAdvisor*, and *BDLawHelp*.
- **Online Research:** Review of literature on AI in legal decision support and document security.
- **User Interviews:** Conversations with legal interns, clients, and lawyers to understand practical workflow issues.

3.3 Benchmark Analysis

A benchmark analysis was performed to understand the strengths and shortcomings of existing solutions. Most online legal-aid systems in Bangladesh lack transparency, trust, and integrated communication between clients and lawyers.

Platform	Lawyer Directory	Online Booking	AI Assistance	Secure Vault	Case Tracking	Multi-language
LegalZoom (USA)	✓	✓	✗	✓	✗	✗
Avvo (USA)	✓	✓	✗	✗	✗	✗
LawAdvisor (Global)	✓	✓	✓ (basic)	✗	✓	✗
BDLawHelp (BD)	✓	✗	✗	✗	✗	✓
Ask Blast (BD)	✗	✗	✗	✗	✗	✓
Complete Legal Aid (Proposed)	✓	✓	✓ (AI + Bangla)	✓	✓	✓

Findings:

- International tools focus on consultation and contracts but ignore localization and affordability.
- Local apps lack trust, security, and user-friendly design.

- None offer **Bangla AI assistance, real-time tracking, or a secure encrypted vault**—key differentiators for our project.

3.4 Gap Analysis

The traditional and existing digital legal aid systems suffer from several operational and usability limitations. The proposed platform eliminates these barriers through a citizen-first design.

Existing Problems	Gaps Identified	Solutions in Complete Legal Aid
Limited accessibility – urban-focused services only.	No centralized national legal platform.	Mobile-responsive system accessible from any device.
Trust issues – unverified lawyers and unreliable advice.	Lack of verification or feedback systems.	Verified profiles with ratings and transparent credentials.
Privacy concerns when sharing sensitive case data.	Weak or no encryption in existing tools.	Encrypted evidence vault with time-limited access links.
Lack of real-time updates.	Manual tracking by phone calls or visits.	Case tracker and automatic notifications.
Language barrier.	Legal terms are difficult for average users.	AI assistant providing plain Bangla explanations.
Complex consultation process.	Offline booking delays and unavailability.	One-click consultation scheduling and live availability view.

Result:

The proposed system closes the “digital justice gap” by combining accessibility, transparency, and AI-assisted learning into a unified platform.

3.5 Survey Findings & Analysis

3.5.1 Methodology

A structured online survey was distributed through Facebook and WhatsApp groups.

- **Total Respondents:** 36
- **Demographics:** 83% general users, 17% lawyers
- **Average Age Group:** 18–24
- **Survey Duration:** 2 days

3.5.2 Key Observations

Question	Major Responses	Design Decision
Do you use any legal aid app?	73% said <i>No</i>	Need strong onboarding and simple “Start Here” flow.
Main challenge in getting legal help?	48%: “Don’t know where to go.”	Add AI triage + verified lawyer directory.
Preferred consultation method?	84%: “Face-to-face.”	Support hybrid options: in-person, phone, video.
What ensures trust in a digital system?	55%: “Strong security & encryption.”	Implement E2E encryption & privacy compliance.
How important is AI assistance?	52%: “Extremely important.”	Integrate bilingual AI legal assistant.
Value of lawyer ratings?	87%: “Very important.”	Prominent rating system on profiles.
Preferred communication channel?	50%: “Email,” 33%: “In-app.”	Multi-channel notification module.
Most requested features	Secure upload vault, Case tracking, AI support	Marked as MVP priorities .

3.5.3 Summary of Insights

- **Trust and Privacy** are top concerns.
- **AI-powered explainers** are viewed as revolutionary in Bangladesh’s legal context.
- **Real-time lawyer availability** and **ratings** improve credibility.
- **Bangla support** increases inclusivity.
- **Emergency help button** ensures fast reporting during critical situations.

3.6 Feature List Fixation

After analyzing survey results, benchmark data, and feasibility feedback, the final feature list for the MVP version was finalized as follows:

MVP Features (Phase 1)

- User registration & authentication
- Verified lawyer directory
- Real-time lawyer availability
- Booking for in-person/online consultations
- AI-powered legal guidance (Bangla + English)
- Secure evidence vault with encrypted uploads
- Case tracking dashboard
- Feedback and lawyer ratings
- Emergency reporting with anonymity
- Admin panel with role-based control

Backlog (Future Versions)

- Payment gateway integration
- Lawyer income analytics
- Client-lawyer video recording archive
- Expanded AI chatbot for contract drafting
- Multi-role access for NGO support teams
- Mobile app (Android + iOS)

Strengths	Weaknesses
<input checked="" type="checkbox"/> Quick access to verified legal help.	<input type="checkbox"/> High initial development cost.
<input checked="" type="checkbox"/> AI-based guidance and multilingual interface.	<input type="checkbox"/> Requires stable internet for optimal performance.
<input checked="" type="checkbox"/> End-to-end encryption and trust transparency.	<input type="checkbox"/> Limited lawyer database at launch.
<input checked="" type="checkbox"/> Anonymous reporting and emergency help.	<input type="checkbox"/> Continuous maintenance required for AI accuracy.

Opportunities	Threats
 Rising digital adoption in Bangladesh.	 Cybersecurity and privacy threats.
 Collaboration with law students, NGOs, and firms.	 Competition from future legal-tech startups.
 Growing mobile penetration rate.	 User hesitation toward AI reliability.
 Expansion into mobile app and cross-regional platforms.	 Misuse of uploaded data if unregulated.

Strategic Summary:

To mitigate threats, the system will rely on strong privacy controls, transparent disclaimers, and routine security audits. Continuous improvement of the AI assistant and lawyer verification will maintain trust and adoption.

Priority	Requirement	Category
High	User authentication, Booking, AI legal help, Vault encryption	Functional
High	Responsiveness, Multilingual UI	Non-functional
Medium	Feedback system, Lawyer profile verification	Functional
Medium	Case history exports, Notification control	Functional
Low	Payment system, Mobile version	Future feature

4. Functional Requirements

4.1 User Management

Feature Name: Registration, Authentication & Role Management

Actors: User, Lawyer, Admin

Description

The system provides secure registration, login, and role-based access control (RBAC) for all

platform members. Every user (citizen or lawyer) must authenticate before accessing personalized features.

Preconditions

- The system and database are online.
- Email/SMS gateway operational.

ID	Requirement	Description
FR-UM-01	Account Registration	Allow signup via email or phone with OTP verification.
FR-UM-02	Authentication	Validate credentials and issue JWT-based session tokens.
FR-UM-03	Password Recovery	Send a secure password reset link/token valid for 15 minutes.
FR-UM-04	Profile Management	Enable users to update profile fields (name, phone, location, specialization).
FR-UM-05	Role-Based Access	Enforce RBAC for User, Lawyer, and Admin on all restricted routes.
FR-UM-06	Account Verification	Admin approves lawyer profiles before public listing.

Acceptance Criteria

- Successful login returns valid token; unauthorized requests return 401.
- Users cannot access modules outside their assigned role.
- Password reset flow completes end-to-end within expiry period.

4.2 Case Intake & Management

Feature Name: Case Creation, Assignment & Tracking

Actors: User, Lawyer, Admin

Description

Users can create cases, upload related documents, and track progress. Lawyers manage assigned cases and update their status.

ID	Requirement	Description
FR-CM-01	Case Creation	Users submit a new case with title, description, category, urgency, and attachments.
FR-CM-02	Unique Case ID	The system auto-generates a unique identifier and sets initial status “Submitted.”
FR-CM-03	Lawyer Assignment	Admin manually assigns or auto-matches based on specialization and load.
FR-CM-04	Case Status Workflow	Statuses: <i>Submitted</i> → <i>In Review</i> → <i>Scheduled</i> → <i>Resolved</i> → <i>Closed</i> .
FR-CM-05	Activity Log	Maintain immutable log (actor, action, timestamp).
FR-CM-06	Case Comments	Enable secure chat/comments between User and Lawyer inside each case thread.
FR-CM-07	Case Search	Filter cases by ID, category, status, or date range.

Acceptance Criteria

- Every case transition is logged and authorized.
- Users view real-time case status and history.
- Only assigned Lawyer/Admin may edit status or add official notes.

4.3 Consultation Scheduling

Feature Name: Appointment Booking & Calendar Management

Actors: User, Lawyer

Description

The platform allows real-time consultation booking through calendar integration. Lawyers manage their availability; users book sessions linked to cases.

Functional Requirements

ID	Requirement	Description
FR-CS-01	Availability Setup	Lawyers define working hours and meeting types (in-person, call, video).
FR-CS-02	Slot Booking	Users request consultation slots referencing case ID.
FR-CS-03	Confirmation & Reschedule	Lawyers confirm, decline, or reschedule with reason.
FR-CS-04	Conflict Prevention	The system prevents double-booking and ensures timezone consistency.
FR-CS-05	Reminders	Auto-send reminders 24 h and 1 h before meeting via email/in-app.
FR-CS-06	Session Summary	Lawyers record session outcome notes attached to case records.

Acceptance Criteria

- Booking only possible in free slots.
- Confirmations and reminders are timely.
- Meeting notes persist and remain editable by the Lawyer only.

4.4 Document Management (Evidence Vault)

Feature Name: Secure File Vault

Actors: User, Lawyer, Admin

Description

A tamper-proof vault stores case-related files securely. All uploads are encrypted and access-controlled.

Functional Requirements

ID	Requirement	Description
FR-DM-0 1	Upload Restrictions	Accept only PDF/DOCX/JPG/PNG \leq 10 MB.
FR-DM-0 2	Server Validation	Perform virus scan and MIME verification.
FR-DM-0 3	Metadata Storage	Record file name, hash, uploader, and timestamp.
FR-DM-0 4	Time-Limited Access	Generate expiring download URLs with role authorization.
FR-DM-0 5	Template Repository	Provide legal templates (affidavit, complaint, agreement).
FR-DM-0 6	Lawyer Requests	Lawyers can request missing files from clients with deadlines.

Acceptance Criteria

- Unauthorized users denied access (403).
- Expired links are automatically invalidated.
- Files retrievable and traceable through metadata logs.

4.5 Legal AI Assistant

Feature Name: AI-Powered Legal Guidance

Actors: User, Lawyer

Description

An AI chatbot assists users with basic legal knowledge, form explanations, and document summaries in Bangla and English.

Functional Requirements

ID	Requirement	Description
FR-AI-1	Conversational Interface	Interactive Q&A for general legal information (with disclaimer).
FR-AI-2	Document Summary	Extract entities (names, dates, case types) from uploaded docs.
FR-AI-3	Draft Generation	Auto-create basic legal drafts (complaint outline, affidavit).
FR-AI-4	Confidence Display	Show confidence level and source references.
FR-AI-5	Activity Logging	Record AI queries and responses for transparency.
FR-AI-6	Safety Filters	Block prohibited content or personal data exposure.

Acceptance Criteria

- Disclaimers shown before each chat.
- Outputs tagged “AI Generated – To Be Reviewed by Lawyer.”
- Inappropriate prompts filtered automatically.

4.6 Communication & Notifications

Feature Name: Secure Messaging & Alerts

Actors: User, Lawyer, Admin

Description

Facilitates in-app, role-based communication and notification updates.

ID	Requirement	Description
FR-CN-1	In-Case Messaging	Text + file chat between Lawyer and User within assigned case.
FR-CN-2	System Notifications	Trigger on new assignment, document upload, or status change.

FR-CN-3 Preference Settings Users customize channels (email, SMS, in-app).

FR-CN-4 Read Receipts Track delivery/read status.

Acceptance Criteria

- Notifications delivered within 5 seconds of the event trigger.
- Messages encrypted end-to-end and stored chronologically.

4.7 Admin Console

Feature Name: Administration, Monitoring & Analytics

Actors: Admin

Description

Admins oversee user accounts, feature configurations, and generate performance analytics.

ID	Requirement	Description
FR-AD-01	Dashboard Metrics	Display active users, open cases, SLA violations.
FR-AD-02	CRUD Operations	Manage users, case categories, and templates.
FR-AD-03	Audit Trail	Log all privileged actions (actor, timestamp, resource).
FR-AD-04	Data Export	Export CSV reports with filters (date, user type).

Acceptance Criteria

- Only Admins can access this panel.
- All critical actions logged and exportable.

4.8 Search & Reports

Feature Name: Global Search & Case Reports

Actors: User, Lawyer, Admin

ID	Requirement	Description
FR-SR-1	Global Search	Keyword search across cases, lawyers, and documents.
FR-SR-2	Case Report Export	Generate printable PDF summaries including timeline and evidence list.
FR-SR-3	Saved Filters	Allow users to save frequent search filters.

Acceptance Criteria

- Typical queries return results < 2 s.
- Reports properly formatted and downloadable.

4.9 Localization & Accessibility

Feature Name: Bilingual & Accessible Interface

Actors: All

ID	Requirement	Description
FR-LA-1	Language Support	Provide full UI in English and Bangla, switchable in real-time.
FR-LA-2	Accessibility	Follow WCAG 2.1 AA standards (screen-reader labels, keyboard nav).
FR-LA-3	Localization	Format time/date/currency per locale.

Acceptance Criteria

- Language toggle works without reload.
- Forms accessible via keyboard and labeled for assistive tech.

4.10 Data Retention & Consent

Feature Name: Data Export, Retention, and Consent Logging

Actors: User, Admin

ID	Requirement	Description
FR-DC-01	User Data Export	Allow users to download their complete data (JSON/ZIP).
FR-DC-02	Retention Policy	Admin defines archival periods per data type.
FR-DC-03	Consent Recording	Capture explicit consent with versioned policy record.

Acceptance Criteria

- Exports complete within reasonable time (< 30 s typical).
- Consent records retrievable by Admin on demand.

5. External & Non-Functional Requirements

5.1 User Interfaces

Description

The platform provides an intuitive, responsive, and consistent user interface across devices. It prioritizes readability, accessibility, and minimal cognitive load.

Aspect	Specification
Design Standard	Material Design + Flat UI Principles
Primary Users	User (Citizen), Lawyer, Admin
UI Style	Clean, minimal layout with high contrast for readability
Color Palette	Blue (trust), gray (neutral), and soft white backgrounds
Typography	Sans-serif (Roboto / Inter) for clarity and accessibility

Navigation	Sidebar with persistent icons for Home, Cases, Vault, AI, Settings
Responsiveness	Adaptive grid layout for mobile, tablet, and desktop views
Accessibility	ARIA-labeled buttons, alt text for icons, high-contrast themes

Acceptance Criteria

- All primary features accessible within 3 clicks.
- UI loads within 2 seconds on standard broadband.
- Color contrast ratio $\geq 4.5:1$ per WCAG 2.1 AA.

5.2 Software Interfaces

Interface	Purpose	Integration Type
Database	PostgreSQL	RESTful ORM (SQLAlchemy / Mongoose)
AI Engine	NLP-based model for bilingual Q&A and document summarization	Internal API
File Storage	Encrypted cloud object storage (AWS S3 / Firebase)	SDK Integration
Email/SMS Gateway	OTP, reminders, notifications	Third-party API (Twilio/SendGrid)
Web Frontend	React / Next.js	RESTful API calls
Backend Services	Python (FastAPI)	Microservice-based modular structure

Compatibility:

All APIs follow JSON schema and support HTTPS/TLS for secure data transport.

5.3 Performance Requirements

The system must maintain high responsiveness and stability under expected loads.

Metric	Target
System Uptime	$\geq 99.9\%$ annually
Average Response Time	≤ 2 seconds for 95% of user actions
Concurrent Users (MVP)	10 000 active users
Max Upload Size	10 MB per file
Background Job Latency	< 30 seconds (notifications, reminders)
Database Query Time	≤ 300 ms average

Scalability:

Microservice deployment allows horizontal scaling using container orchestration (Docker/Kubernetes).

Load Testing: Performed using JMeter to simulate peak traffic scenarios.

5.4 Security & Privacy Requirements

Security is the core trust foundation of the platform.

Area	Requirement
Authentication	JWT-based sessions; Two-Factor Authentication (2FA) for Lawyers & Admins
Authorization	Role-Based Access Control (RBAC) across endpoints
Encryption	AES-256 for data at rest; TLS 1.3 for data in transit
Password Policy	Minimum 8 chars, mixed-case, numeric + symbol
Session Management	Auto-logout after 20 minutes of inactivity
Data Privacy	User consent before data sharing/export; GDPR-like compliance
Audit Logging	All admin and case-critical events logged with timestamp
Backup Security	Daily encrypted backups stored on isolated server
Vulnerability Scanning	Monthly penetration tests and patch updates

Acceptance Criteria

- All sensitive data is encrypted end-to-end.
- Unauthorized data access attempts logged and blocked.
- Users informed of privacy policy before first login.

5.5 Usability & User Experience Requirements

Criteria	Target
Learnability	First-time user completes basic task < 3 min
Accessibility	WCAG 2.1 AA compliant
Consistency	Uniform iconography, labels, and color usage
Error Prevention	Inline validation and clear error messages
Feedback Time	< 1 s visual response for any user action
Mobile Friendliness	Optimized for \leq 6-inch screens

User testing sessions will ensure that navigation is intuitive even for non-technical citizens. A continuous feedback widget will collect suggestions post-launch.

5.6 Reliability, Backup & Recovery

Category	Requirement
Data Backup	Full database daily; incremental hourly backups
Disaster Recovery	Recovery Point Objective (RPO): 30 minutes; Recovery Time Objective (RTO): 1 hour
Failover	Cloud replication ensures automatic failover on outage

Error Handling	Graceful fallback pages with human-readable messages
Redundancy	Multi-region cloud storage replication

5.7 Maintainability & Extensibility

Requirement	Description
Code Modularity	Each module (AI, Booking, Vault) is isolated for updates without downtime.
Version Control	Git-based repository with branching and rollback capability.
Documentation	Inline code docs + API Swagger docs auto-generated.
Test Coverage	$\geq 80\%$ for unit and integration tests.
CI/CD Pipeline	Automated builds, linting, and deployment.
Extensibility	Support for plug-and-play future modules (payment, analytics).

6. Feasibility & Project Management Analysis

6.1 Introduction

The feasibility analysis evaluates the practicality of implementing the Complete Legal Aid – Legal & Judicial Communication Platform from multiple dimensions: technical, operational, economic, human, and schedule feasibility. The objective is to ensure that the system is not only technically sound but also financially viable, easy to operate, and sustainable over time. The following subsections describe the outcome of the feasibility study conducted after requirement analysis and prototype planning.

6.2 Technical Feasibility

Overview

The proposed system is technically feasible using currently available tools and technologies. The architecture emphasizes modularity, scalability, and security.

Component	Technology Stack	Reason for Selection
Frontend	React.js / Next.js	High performance, reusable components, mobile responsiveness
Backend	Node.js (Express) / Python (FastAPI)	Lightweight, scalable, supports REST APIs
Database	PostgreSQL (relational) / MongoDB (NoSQL for AI logs)	Reliable, ACID-compliant, supports flexible data models
AI Module	NLP-based Assistant using Python + OpenAI API / Local LLM	Enables bilingual text processing and summarization
Cloud Hosting	AWS / Render / Firebase	Reliable uptime, built-in scalability
Security	SSL/TLS + AES-256 encryption	Industry-standard for sensitive data protection

Key Strengths:

- Modular microservice architecture for easy updates.
- Cloud deployment ensures horizontal scalability.
- Open-source stack minimizes development cost.
- High security standards with encrypted communication and storage.

Conclusion:

All components are technically achievable with the team's expertise. The infrastructure can scale as user demand grows, ensuring future readiness.

6.3 Operational Feasibility

Goal

To evaluate whether the system can be operated, maintained, and used effectively by all stakeholders (Users, Lawyers, and Admins).

Factor	Assessment
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User Training	Minimal; simple UI and bilingual labels reduce learning curve.
Lawyer Onboarding	Verification handled by Admin; guided setup wizard for first login.
Admin Operations	Dashboard-based control and real-time analytics simplify management.
Maintenance	Modular code allows isolated bug fixes without downtime.
Support Plan	24/7 in-app chatbot and email support for issues.

Conclusion:

The system is highly operable. Both lawyers and citizens can use the platform with minimal training, and the admin tools simplify oversight.

6.4 Economic (Financial) Feasibility

Objective

To ensure that the development and maintenance costs are justified by the system's social and functional value.

Cost Component	Estimated Cost (BDT)	Frequency	Description
Development Hardware	150,000	One-time	Developer laptops and testing devices
Software Tools / Licenses	40,000	One-time	Cloud hosting, APIs, SSL, domain
Cloud Hosting (AWS / Firebase)	5,000 / month	Recurring	Storage, uptime, backup
Maintenance & Updates	3,000 / month	Recurring	Security patches, updates
Marketing & Awareness	10,000	Initial	Online campaigns, social outreach

Total Initial Investment: \approx BDT 200,000

Monthly Maintenance: \approx BDT 8,000

Benefit Analysis

- Eliminates travel and paperwork costs for users and lawyers.
- Offers freemium and subscription models for sustainability.
- Reduces physical infrastructure costs by digitizing legal workflows.

Cost-Benefit Ratio: Favorable within 6–8 months post-launch.

Conclusion: Economically viable as an MVP and scalable for future monetization.

6.5 Human Resource Feasibility

Team Composition

Role	Responsibility	Assigned Member
Project Lead	System design, architecture planning	Md. Tanzamul Azad
Frontend Developer	React.js UI development, responsive design	Israt Jerin Porshi
Backend Developer	API and database design	Jahidul Islam
AI & Data Engineer	AI chatbot integration and training	Md. Jamiul Hasan
QA Engineer	Testing, validation, and documentation	Md. Fahad

Conclusion:

The current team possesses all required technical skills to complete the MVP. Additional expertise (security audit, UI polish) may be added during scaling.

6.6 Schedule Feasibility

Development Timeline (6-Month Plan)

Phase	Duration	Key Deliverables
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1. Requirement Analysis	2 weeks	Finalized SRS, Feasibility Report
2. System Design	3 weeks	UML diagrams, ERD, wireframes
3. Development (Frontend & Backend)	8 weeks	Core modules (User, Lawyer, Admin)
4. AI & Security Integration	4 weeks	Legal Assistant, Encryption layer
5. Testing & Debugging	3 weeks	Functional + Non-functional testing
6. Deployment (MVP)	2 weeks	Beta version hosted online
7. Maintenance & User Feedback	Continuous	Update patches, improve AI quality

Project Duration: ~22 weeks (\approx 5.5 months)

Methodology: Agile Scrum (bi-weekly sprint reviews)

Tracking Tools: Jira / Trello for sprint planning

Conclusion:

The timeline is achievable given the modular design and clear team responsibilities.

6.7 Market / Social Feasibility

Factor	Evaluation
Market Demand	High — citizens increasingly prefer online assistance.
User Acceptance	Strong, based on survey where 67% wanted 24/7 legal support.
Differentiation	Only platform offering AI + Vault + Consultation combo.
Scalability	National rollout possible with server scaling and Bangla interface.
Social Impact	Promotes equal access to justice, legal literacy, and trust.

Conclusion:

High market potential due to unmet need for accessible legal help and growing digital literacy among citizens.

6.8 SWOT Summary

Strengths	Weaknesses
✓ AI-driven bilingual legal support	🚫 Initial limited lawyer pool
✓ Strong encryption & data protection	🚫 Dependence on stable internet
✓ Intuitive interface & inclusive UX	🚫 Maintenance of AI accuracy
Opportunities	Threats
 Expansion to NGOs, law firms, and academia	 Data privacy breaches
 Mobile app growth in rural Bangladesh	 Competitive duplication by startups
 Community-based legal education	 AI misuse or misinformation risks

Strategic Response:

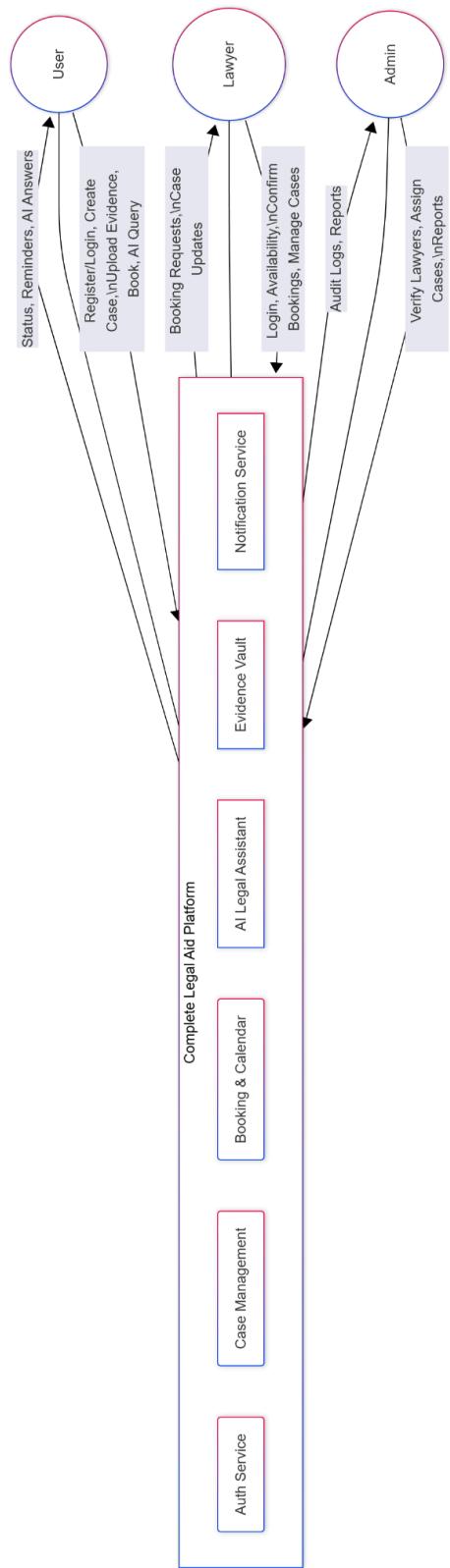
Proactive monitoring, frequent AI retraining, transparency in policy, and continuous security upgrades will sustain user trust and long-term adoption.

6.9 Feasibility Conclusion

The overall feasibility assessment confirms that the Complete Legal Aid Platform is technically achievable, financially viable, operationally efficient, and socially valuable.

With a clear roadmap, skilled team, and strong user interest, this system can evolve from a university project into a real-world legal-tech product that bridges the justice gap in Bangladesh.

7.0 Context Diagram



The Context Diagram of the *Complete Legal Aid Platform* represents the overall structure of the system and its interaction with external entities — User, Lawyer, and Admin.

At the center, the Complete Legal Aid Platform is divided into six major functional modules:

1. Auth Service – Handles user registration, login, authentication, and access control.
2. Case Management – Allows users to create, manage, and track their legal cases.
3. Booking & Calendar – Enables scheduling of lawyer appointments and managing availability.
4. AI Legal Assistant – Provides instant legal answers, AI guidance, and recommendations.
5. Evidence Vault – Offers secure upload and storage for documents and case evidence.
6. Notification Service – Sends status updates, reminders, and booking confirmations.

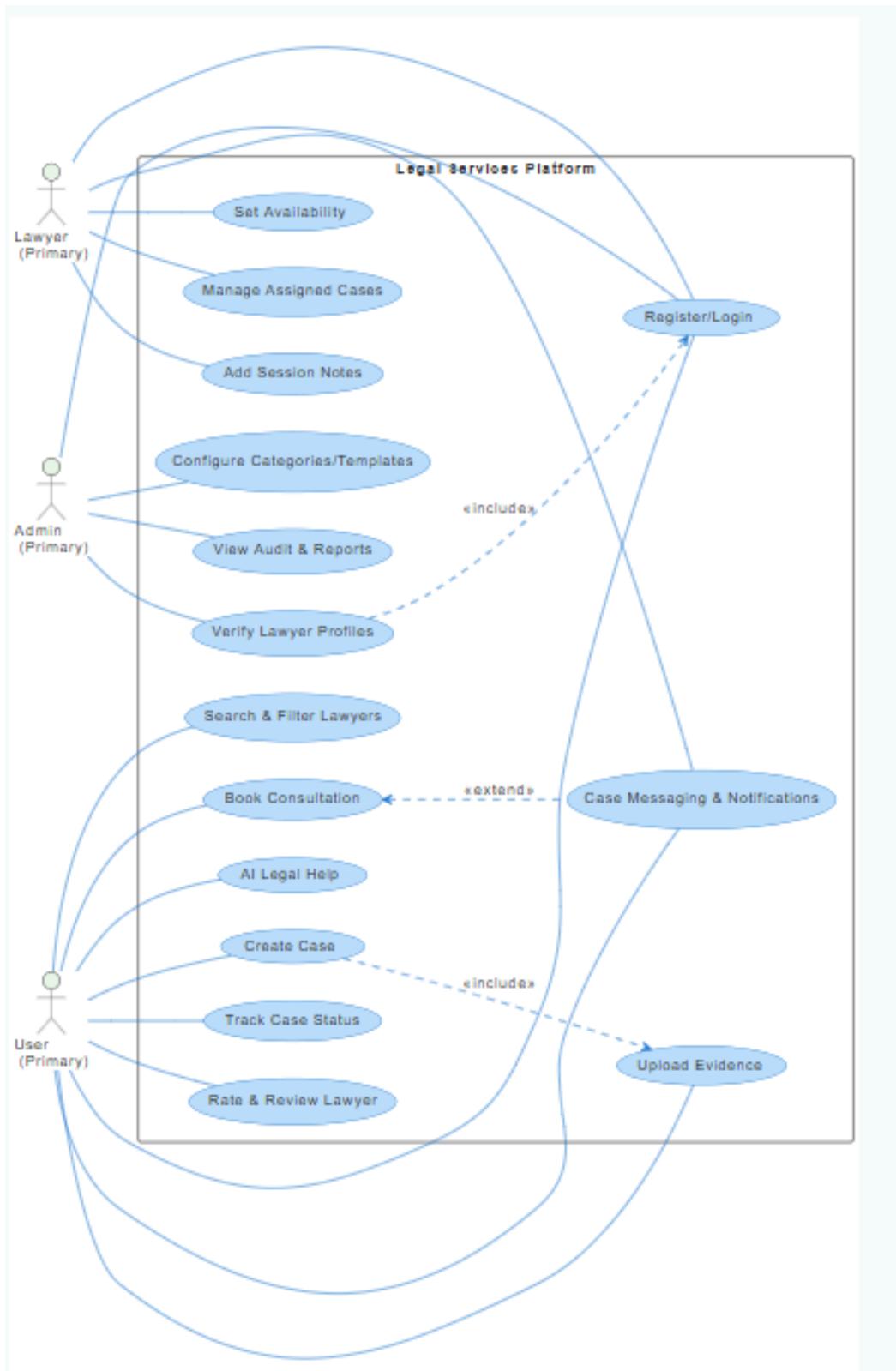
Users interact with the platform to register, create cases, upload evidence, and consult lawyers or AI assistants.

Lawyers manage bookings, confirm availability, update case progress, and communicate with clients.

Admins verify lawyers, assign cases, maintain audit logs, and generate reports for system monitoring.

This diagram clearly outlines how data and actions flow between external actors and the core system, establishing a clear boundary and interaction pattern for the *Complete Legal Aid* application.

7.1 Use Case Diagram



Use Case Diagram Description

The Use Case Diagram of the *Complete Legal Aid Platform* illustrates how different types of users — User (Citizen), Lawyer, and Admin — interact with the system to perform various legal and administrative activities.

1. User (Citizen):

- Can Register/Login to access the platform.
- Create Case by submitting details and uploading documents via the Upload Evidence use case.
- Search & Filter Lawyers based on specialization and availability.
- Book Consultation, which extends to Case Messaging & Notifications for communication and reminders.
- Access AI Legal Help for quick legal guidance.
- Track Case Status to view progress updates.
- Rate & Review Lawyers after consultation for transparency.

2. Lawyer:

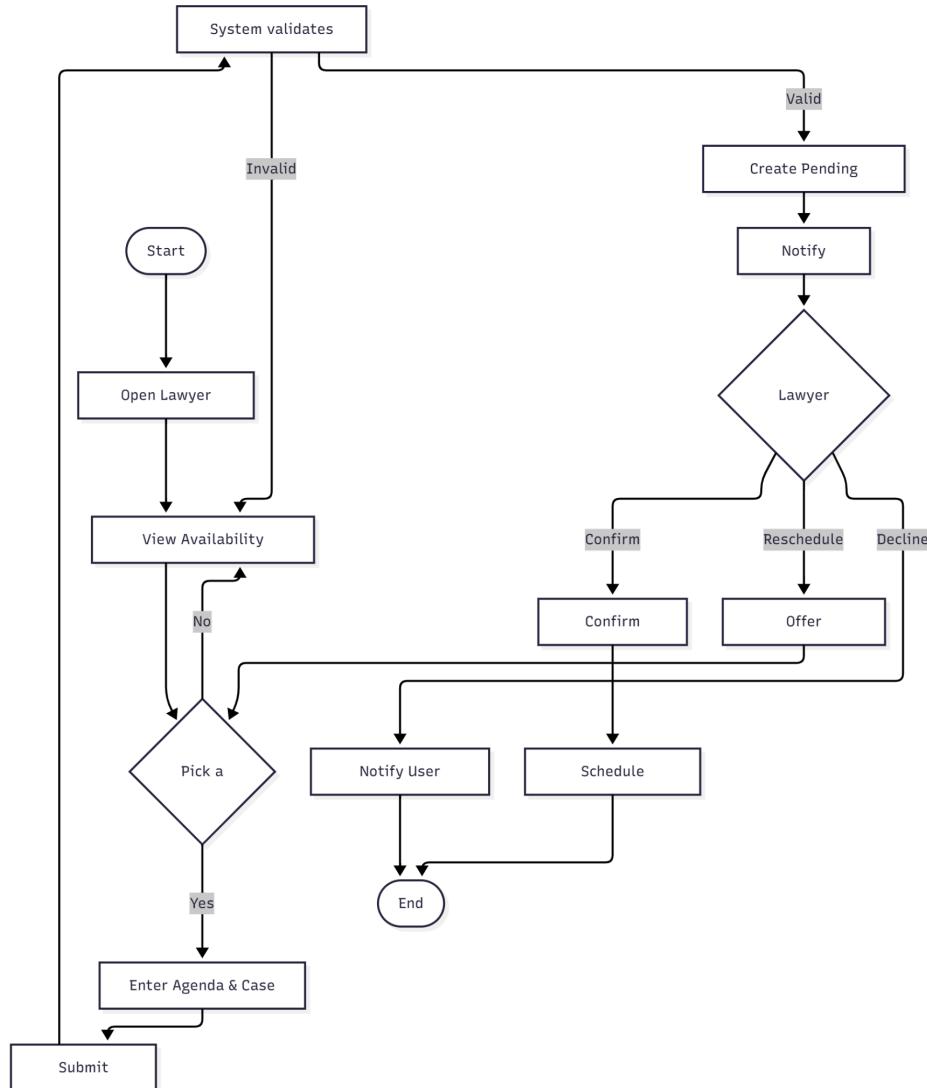
- Can Set Availability and Manage Assigned Cases.
- Add Session Notes after meetings or consultations.
- Receives Case Messaging & Notifications for updates.

3. Admin:

- Handles Register/Login verification for lawyers.
- Verify Lawyer Profiles and Filter Lawyers for quality control.
- Configure Categories/Templates for different case types.
- View Audit & Reports to monitor activity.

The diagram clearly defines role-based functionality and relationships between actions. The *includes* and *extends* relationships (e.g., Book Consultation → extends Case Messaging & Notifications) demonstrate modular interactions among system processes, ensuring flexibility and scalability of the legal aid platform.

Activity Diagram



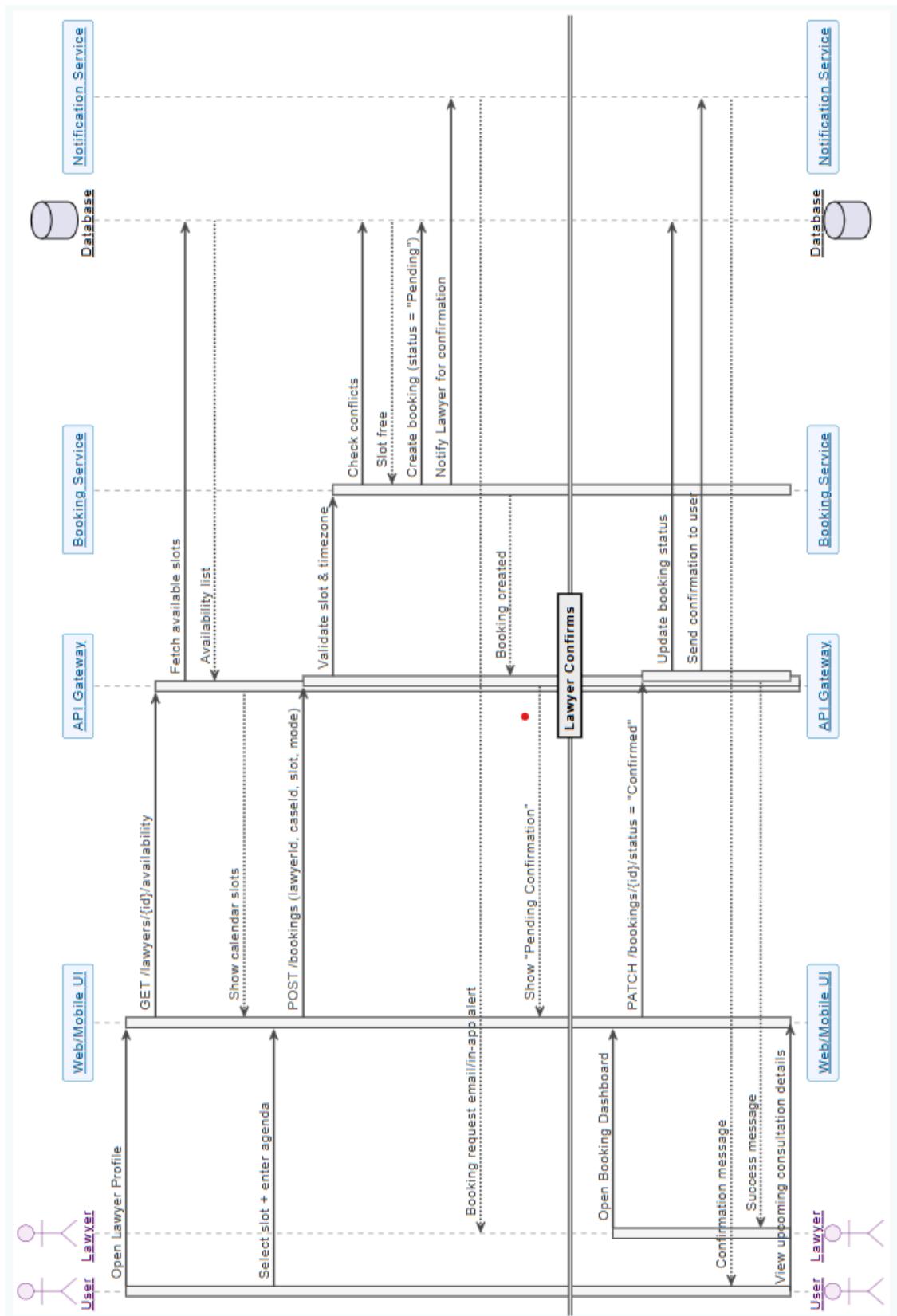
The **Activity Diagram** of the *Complete Legal Aid* system illustrates how different users—**citizens, lawyers, and administrators**—interact within the platform.

The process starts when a user logs in or registers. After authentication, the system identifies the user's role.

- **Citizens** can report incidents, upload evidence, book verified lawyers, and track case progress. They can also use the **AI Legal Assistant** for instant legal guidance or emergency support.
- **Lawyers** can view assigned cases, update statuses, communicate with clients, and manage consultation schedules.
- **Admins** oversee the platform, verify lawyers, manage user data, and ensure system security.

The workflow continues until users complete their tasks and **log out**, ensuring a secure, transparent, and efficient legal service process.

7.1.1 Sequence Diagram

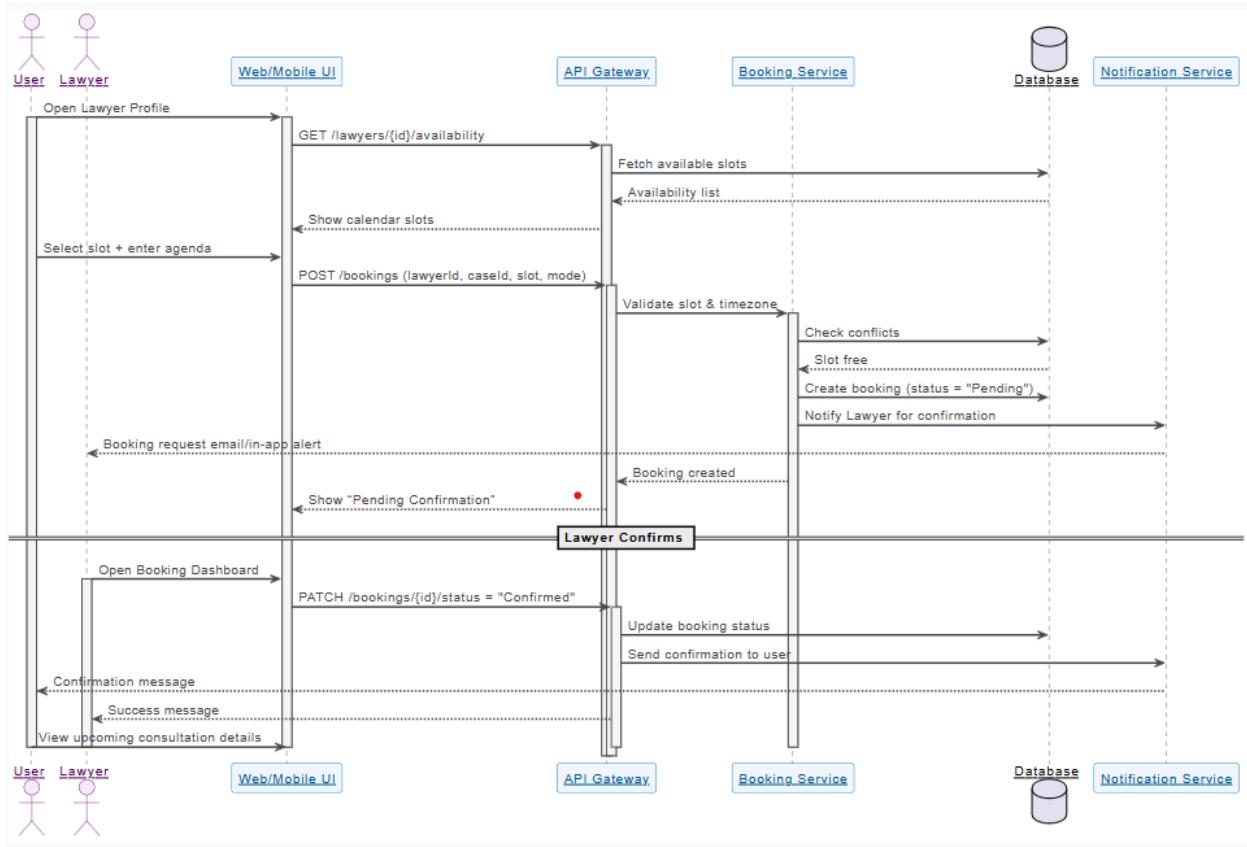


The Sequence Diagram illustrates the step-by-step interaction for the Lawyer Booking Process within the *Complete Legal Aid Platform*. It shows how communication occurs between the User, Lawyer, Web/Mobile UI, API Gateway, Booking Service, Database, and Notification Service.

1. The User opens a lawyer's profile and selects an available slot with an agenda.
2. The Web/Mobile UI requests the lawyer's availability from the API Gateway, which fetches data from the Booking Service and Database.
3. Once the user selects a slot, the booking request is validated and temporarily saved as Pending.
4. The Booking Service notifies the Lawyer through the Notification Service for confirmation.
5. The Lawyer reviews the request in the booking dashboard and confirms the appointment.
6. The Booking Service updates the status to Confirmed in the Database and sends a confirmation message back to the user.

This diagram clearly demonstrates the real-time flow of booking and confirmation between the user and lawyer, ensuring transparency and synchronization within the system.

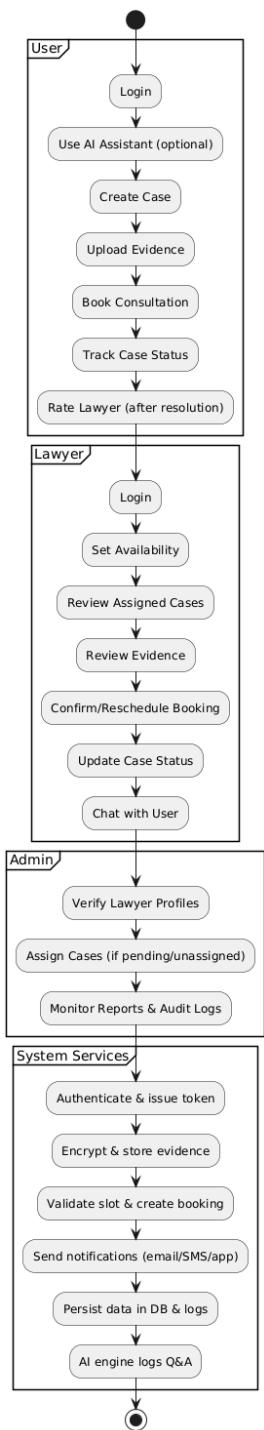
7.1.2 Sequence Diagram



1. The User opens a lawyer's profile through the Web/Mobile UI and selects a slot with an agenda.
2. The API Gateway requests the lawyer's availability from the Booking Service, which retrieves the list from the Database.
3. The user confirms a slot, triggering a booking request. The system validates the slot and creates a record with status “Pending” if it’s available.
4. The Booking Service then notifies the Lawyer through the Notification Service to review the request.
5. The Lawyer opens their booking dashboard and confirms the appointment.
6. The Booking Service updates the booking status to “Confirmed” in the Database and sends a confirmation notification to the user.
7. Finally, the User receives a success message and can view upcoming consultation details in their dashboard.

7.2 Swirlame Diagram

Swimlane - Complete Legal Aid (End-to-End Flow)



The **Swimlane Diagram** of the *Complete Legal Aid Platform* shows the complete end-to-end workflow divided among four main actors — **User**, **Lawyer**, **Admin**, and **System Services**. Each swimlane represents the responsibilities and activities performed by that role throughout the legal aid process.

1. User:

The user logs in, optionally uses the **AI Assistant**, creates a case, uploads evidence, books a consultation, and tracks the case status. After resolution, they can rate the lawyer based on performance.

2. Lawyer:

The lawyer logs in, sets availability, reviews assigned cases and uploaded evidence, confirms or reschedules bookings, updates case progress, and communicates with the user through chat or messages.

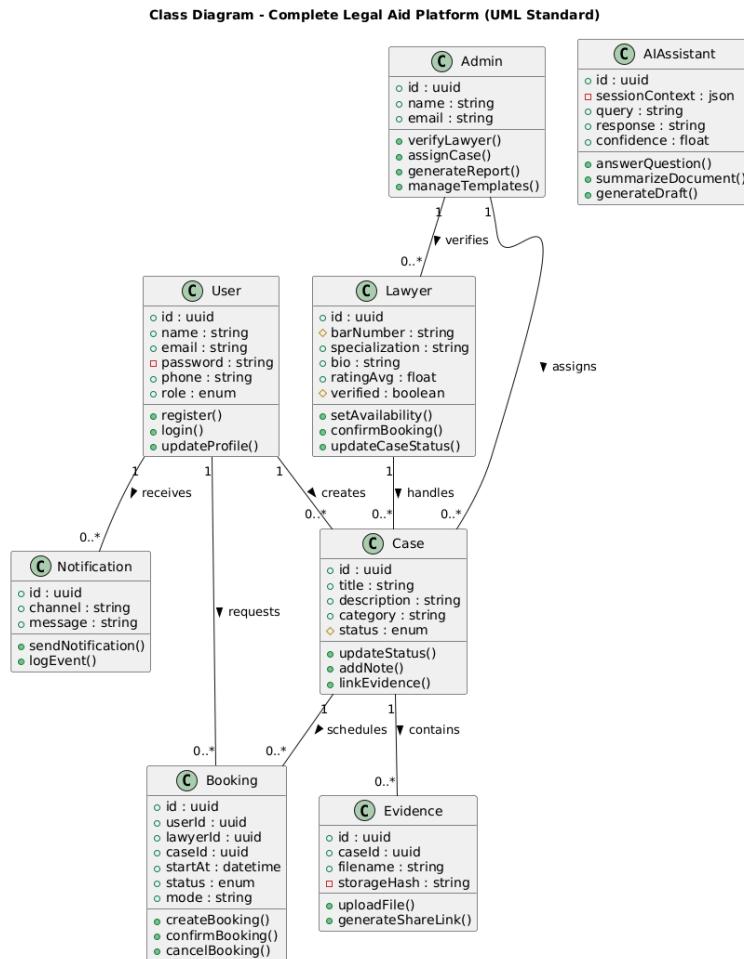
3. Admin:

The admin verifies lawyer profiles, assigns unallocated cases, and monitors system operations through reports and audit logs to ensure transparency and compliance.

4. System Services:

This lane handles automated backend operations—authentication, token generation, evidence encryption, booking validation, notification dispatch, database updates, and AI logging for Q&A interactions.

7.3 Class Diagram



This diagram effectively visualizes the **parallel and collaborative flow** among users, lawyers, admins, and the system backend, ensuring a seamless, secure, and well-managed digital legal assistance process.

The **Class Diagram** of the *Complete Legal Aid Platform* represents the system's object-oriented structure, showing the key classes, their attributes, methods, and relationships. It provides a clear blueprint for how data and functionalities are organized in the application.

1. User Class:

Contains user details such as ID, name, email, password, phone, and role. It includes methods for registration, login, and profile updates.

2. Lawyer Class:

Holds lawyer-specific data like bar number, specialization, bio, rating, and verification status. Functions include setting availability, confirming bookings, and updating case

statuses.

3. Admin Class:

Manages system-level operations such as verifying lawyers, assigning cases, generating reports, and maintaining templates.

4. Case Class:

Represents the main entity for case details—title, description, category, and status. It includes methods to update case status, add notes, and link evidence.

5. Booking Class:

Handles consultation scheduling, containing booking ID, user-lawyer mapping, time slots, and booking mode. It supports creating, confirming, and canceling bookings.

6. Evidence Class:

Stores uploaded files linked to cases, including filename, case ID, and storage hash. Methods handle secure upload and share link generation.

7. Notification Class:

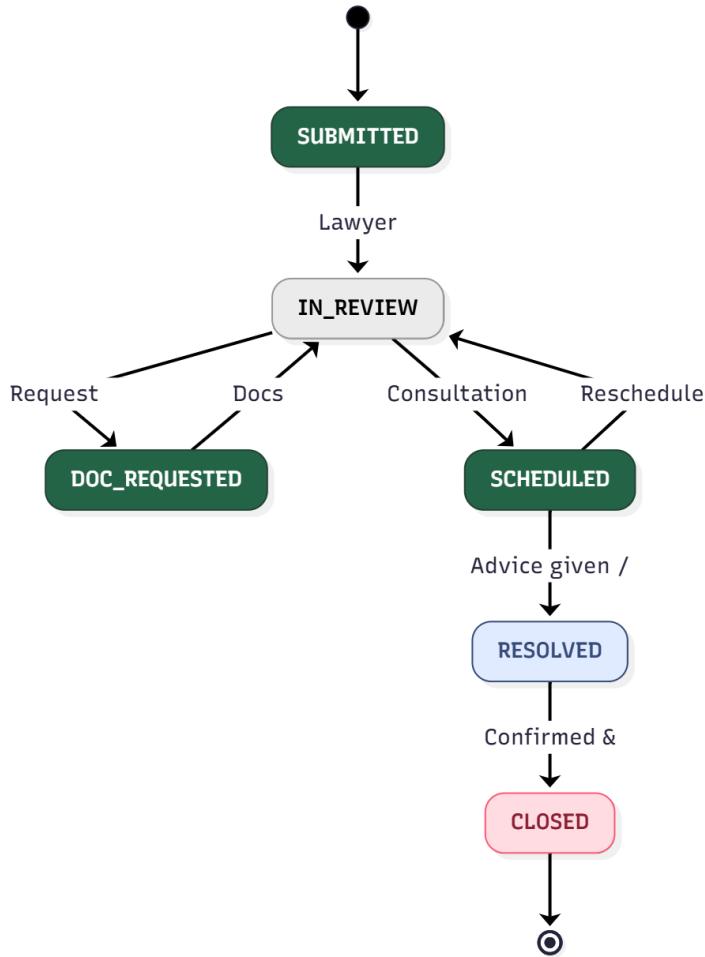
Manages in-app and external alerts through channels like email or SMS. It logs messages and sends notifications based on system events.

8. AIAssistant Class:

Supports automated legal help with methods for answering questions, summarizing documents, and generating draft responses using stored query context.

Overall, this diagram defines the **core data model and logical relationships**—such as one-to-many connections between users, cases, and bookings—ensuring a modular, maintainable, and scalable system design.

7.4 State Diagram



The **State Diagram** of the *Complete Legal Aid Platform* demonstrates the different states a case goes through from submission to closure. It shows how a case transitions between various stages based on lawyer actions, document uploads, and consultation outcomes.

1. Submitted:

The process begins when a user creates and submits a new case with initial details and evidence.

2. In Review:

The lawyer reviews the submitted information to understand the case and determine if additional documents or clarifications are needed.

3. Doc Requested:

If further evidence or paperwork is required, the system moves the case into this state and prompts the user to upload the requested documents.

4. Scheduled:

Once the case is reviewed and necessary documents are complete, the lawyer schedules a consultation or meeting with the client.

5. Resolved:

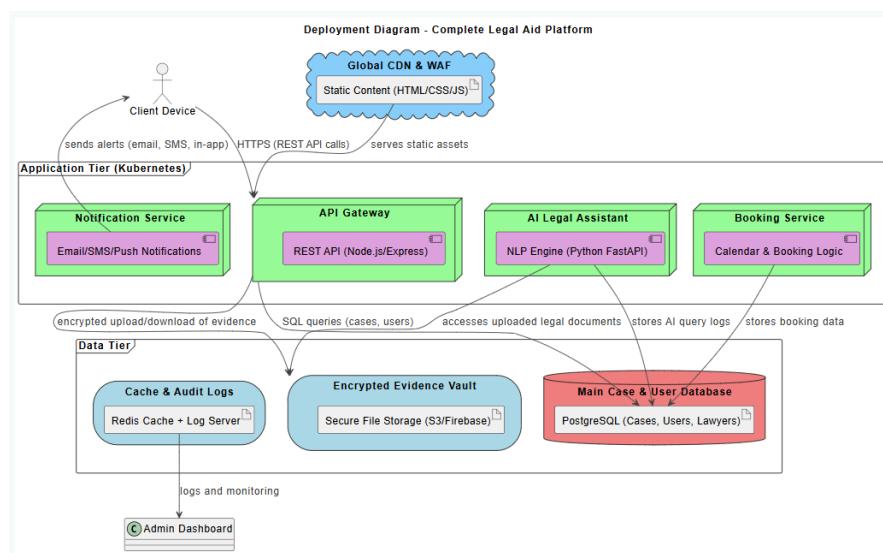
After the consultation, legal advice is given or the issue is resolved through mutual discussion or documentation.

6. Closed:

The final state of the case after confirmation that all actions are completed, advice has been provided, and the matter is officially closed in the system.

This diagram clearly visualizes the **case lifecycle**, ensuring proper tracking and management of every legal request from submission to resolution and closure.

7.4 Deployment Diagram



The **Deployment Diagram** of the *Complete Legal Aid Platform* represents the physical architecture and how various software and hardware components interact to deliver system functionalities. It shows three main tiers: **Client Layer**, **Application Tier**, and **Data Tier**.

1. Client Layer:

Users access the system through **Client Devices** (web or mobile), communicating securely via **HTTPS REST API calls**. Static assets (HTML, CSS, JS) are delivered through a **Global CDN and Web Application Firewall (WAF)** for optimized speed and security.

2. Application Tier (Kubernetes):

- **API Gateway:** Manages REST API requests using Node.js/Express and connects the frontend with backend services.
- **AI Legal Assistant:** Built with Python FastAPI, it processes natural language queries, summarizes documents, and generates AI-based drafts.
- **Booking Service:** Handles consultation scheduling and lawyer availability management.
- **Notification Service:** Sends real-time alerts via email, SMS, and in-app push notifications.

3. Data Tier:

- **Main Case & User Database:** Stores core data (cases, users, lawyers) in **PostgreSQL**.
- **Encrypted Evidence Vault:** Uses secure file storage (e.g., S3 or Firebase) for encrypted evidence uploads and retrievals.
- **Cache & Audit Logs:** Uses **Redis** for fast caching and log monitoring, supporting quick access and data integrity.

4. Admin Dashboard:

The admin monitors logs, system performance, and security metrics through this interface, ensuring stability and compliance.

This architecture ensures a **scalable, secure, and efficient deployment**—balancing performance with strong data protection and modular service orchestration.

8. Prototype Design and User Interface

8.1 Introduction

The prototype of the Complete Legal Aid – Legal & Judicial Communication Platform serves as a visual and functional demonstration of the system's core workflows. It

bridges the gap between conceptual requirements and real implementation, allowing early usability testing and feedback collection.

The design focuses on clarity, accessibility, and trust—critical for a system that deals with sensitive legal data.

8.2 Design Objectives

User-Centricity: Ensure citizens and lawyers can navigate the interface without technical training.

Consistency: Maintain a uniform color scheme, typography, and layout across web and mobile views.

Transparency: Highlight lawyer verification, case progress, and secure evidence indicators.

Accessibility: Provide bilingual (Bangla and English) content with clear icons and tooltips.

Scalability: Support future features like video consultations and payment gateways without redesign.

8.3 Prototype Tools

The user interface was designed using Figma

It supports:

Interactive navigation and screen transitions.

Component reuse for headers, sidebars, and forms.

Auto-layout features for responsiveness across screen sizes.

(You will upload these figures later — placeholders below are added for report clarity.)

8.4 UI Layout and Pages

8.4.1 Dashboard Page

Purpose: Central control hub showing case status, notifications, and shortcuts to AI assistant or lawyer booking.

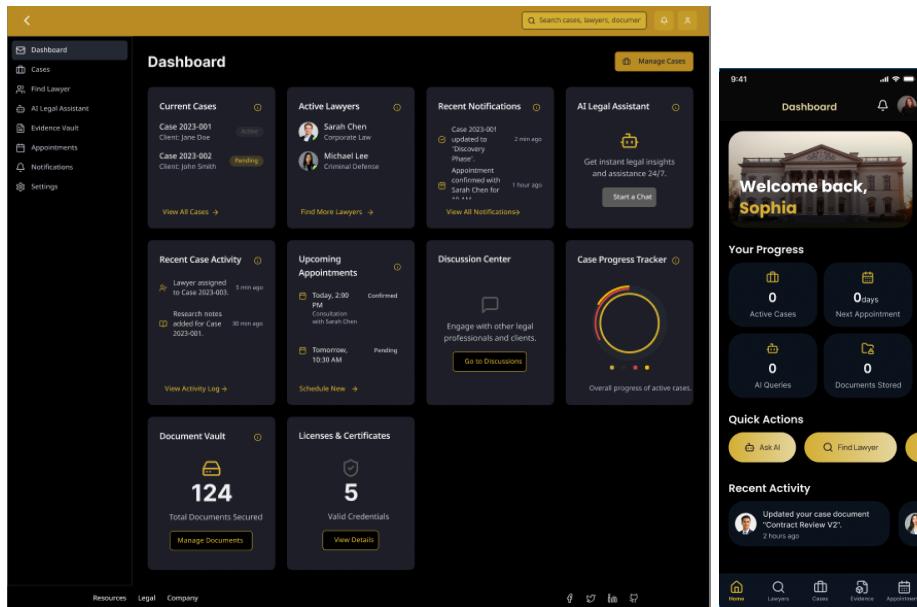
Features:

Sidebar with persistent menu: Home, Cases, AI Assistant, Evidence Vault, Notifications, Settings

Header showing user role, search bar, and profile dropdown.

Main body with “Recent Cases” and “Upcoming Bookings.”

Color scheme: UIU Blue (#004AAD) and Neutral White (#F9FAFB) for readability.



8.4.2 Lawyer Directory and Booking Page

Purpose: Allow users to search, filter, and book verified lawyers.

Key Components:

- Search filters (specialization, language, location, rating).
- Lawyer card with name, profile, rating, and “Book Consultation” button.
- Real-time calendar pop-up for slot selection.

Status tags: Available / Busy / Verified.

[Figure 8.2: Lawyer Directory and Booking Page]

8.4.3 Case Management Page

Purpose: Enable users to track their submitted cases and view updates.

Features:

- Timeline-based case tracker with status icons.
- Tabs: Overview, Messages, Evidence, Activity Log.
- File upload module linked to Evidence Vault.

Case Details

Environmental Law
Representing local communities against a large industrial corporation for a alleged pollution and environmental damage. This complex case involves extensive scientific evidence and regulatory compliance review.

Action

Case Progress

- October 26, 2023 **Initial Complaint Filed**
Formal complaint lodged with the district court, alleging multiple environmental violations.
- November 15, 2023 **Discovery Phase Initiated**
Exchange of evidence and information between legal teams begins.
- January 05, 2024 **Expert Witness Testimony**
Environmental scientists provided expert testimony and reports on impact assessments.
- February 28, 2024 **Settlement Negotiations**
Initial discussions with the defense for potential out-of-court resolution.
- March 01, 2024 **Pre-Trial Hearing**
Scheduling and procedural matters to be addressed before trial.

Key Dates

Next Hearing	March 30, 2024
Discovery Deadline	March 15, 2024
Trial Date	April 23, 2024

Assigned Client

John Doe
johndoe@email.com

Related Documents

- Initial Complaint.pdf 10/26/2023 [View](#)
- Discovery Request.docx 11/01/2023 [View](#)
- Expert Testimony.pdf 01/05/2024 [View](#)

[View All Documents](#)

[Update Case](#) [Archive Case](#)

Case Details - Property Dispute (CLA-2024-001)

Case Summary

Case ID	CLA-2024-001	Client Name	Jane Doe
Case Type	Civil Litigation	Status	Active
Filing Date	2024-01-15	Next Hearing	2024-07-22
Assigned Attorney	Robert Sterling	Court	Superior Court, District 1

Case Description

This case involves a complex property boundary dispute between two adjacent landowners. The primary objective is to mediate a resolution or, failing that, proceed with litigation to establish clear property lines and address damages.

Quick Links Resources Company

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8.4.4 Evidence Vault

Purpose: Secure repository for uploading and managing encrypted documents.
 Features:

Drag-and-drop file upload with progress meter.

Document list view: filename, type, upload date, access level.

“Share with Lawyer” toggle and time-limited link generation.

Visual cue for encryption (padlock icon and hash ID).

The screenshot shows a software interface titled "Evidence Vault". On the left is a vertical sidebar with navigation links: Dashboard, User Management, Lawyer Verification, Appointments & Cases, Evidence Vault (which is selected and highlighted in blue), Feedback & Complaints, Analytics & Reports, Payment System, Settings, and Logout. The main content area is titled "All Case Documents" and contains a sub-instruction: "Manage all uploaded evidence files across various cases.". Below this is a table with the following data:

Case ID	File Name	Uploaded By	Date	Action
JOB-2023-001	Client_Brief_Smith_v_Jones.pdf	John Doe	2023-10-26	Download
JOB-2023-001	Exhibit_A_Email_Correspondence.zip	John Doe	2023-10-25	Download
JOB-2023-002	Witness_Statement_Garcia.docx	Jane Smith	2023-10-28	Download
JOB-2023-003	Court_Order_Motion_Granted.pdf	Admin User	2023-11-01	Download
JOB-2023-004	Deposition_Transcript_Adams.txt	John Doe	2023-11-05	Download
JOB-2023-005	Contract_Agreement_Partnership.pdf	Jane Smith	2023-11-10	Download
JOB-2023-006	Research_Notes_Patient_Law.md	Admin User	2023-11-12	Download

8.4.5 AI Legal Assistant

Purpose: Provide conversational legal help in Bangla and English.

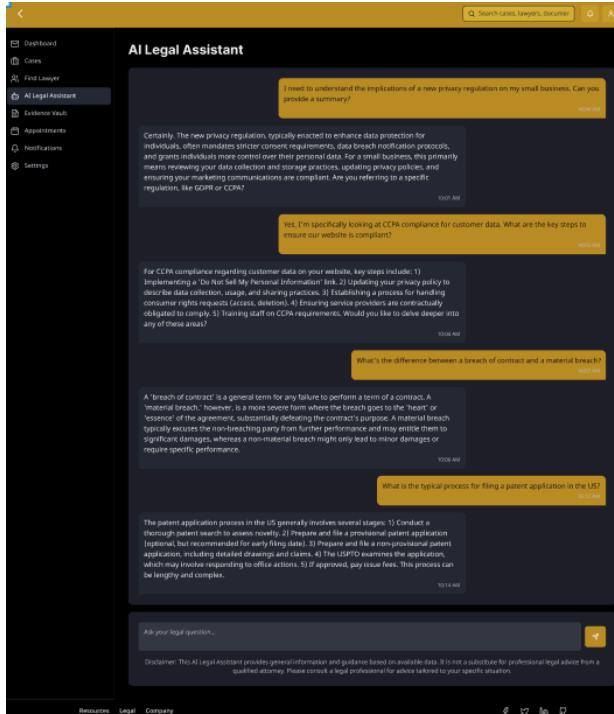
Interface:

Chat-style layout with user input field and AI responses.

Disclaimers automatically displayed for each answer.

Optional file upload for document analysis.

Right-side panel showing related laws or sections.



8.4.6 Admin Panel

Purpose: Allow administrators to manage users, lawyers, and reports.

Modules:

Verification Tab: Pending lawyer approvals.

System Logs: View login attempts, errors, and audit trails.

Analytics: Display charts of active cases, AI usage, and user growth.

Templates: Manage legal document formats.

8.4.7 Responsive Mobile View

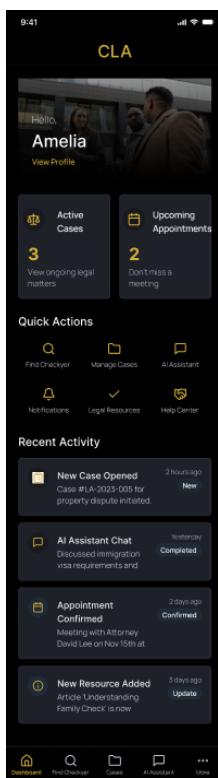
Purpose: Provide a seamless experience on mobile devices.

Features:

Collapsible sidebar.

Floating action button for quick booking or evidence upload.

Adaptive font sizes and contrast adjustments.



8.5 Color and Typography System

Element	Color / Font	Purpose
Primary	#004AAD (UIU Blue)	Trust & identity
Secondary	#4A4A4A (Gray)	Neutral readability
Accent	#00B894 (Green)	Success / Confirmation
Warning	#E17055 (Red-Orange)	Alerts / Errors
Font Family	Inter / Roboto / Noto Sans Bengali	Professional, bilingual support

Font Sizes 12pt (text), 16pt (headings), 20pt (titles) Consistency & accessibility
8.6 Accessibility Considerations

Keyboard navigation supported throughout.

ARIA-labeled UI elements for screen readers.

Text-to-speech toggle for visually impaired users.

High-contrast mode for color-blind accessibility.

8.7 Prototype Conclusion

The prototype demonstrates how technology and design come together to simplify legal access while maintaining privacy and trust.

It establishes the visual identity and interaction model that the final implementation will follow.

Chapter 9: Conclusion

The Complete Legal Aid – Legal & Judicial Communication Platform bridges the long-standing gap between citizens and legal professionals in Bangladesh.

By leveraging secure cloud infrastructure, AI assistance, and bilingual accessibility, it turns complex legal procedures into a transparent, digital experience.

The SRS, diagrams, and prototypes collectively define a system that is:

- Technically feasible (built with scalable, open-source technologies).
- Socially impactful (promotes justice and inclusivity).
- Economically sustainable (minimal maintenance, freemium scalability).

Future versions can expand features like mobile apps, NGO collaboration, and payment integrations, further enhancing legal accessibility nationwide.

This project sets a new benchmark for ethical, secure, and citizen-friendly legal technology.

Chapter 10: References

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Chapter 11: Appendices

Appendix A – Survey Questionnaire

Includes user and lawyer feedback forms on accessibility, trust, and feature importance.

Appendix B – Glossary of Terms

Term Definition

AI Assistant Chat-based system for automated legal help.

Evidence Vault Encrypted digital repository for storing case files.

Booking System Calendar-based module for lawyer appointments.

RBAC Role-Based Access Control for managing user privileges.

JWT JSON Web Token – secure authentication token.