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Advosys: Role Based Legal Management System

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Abstract

Legal work in India is still done offline on paper, in physical offices, with no digital system in place. Clients must visit advocates in person just to get a case update, documents are handed over physically, and hearing dates are communicated by phone. This makes the legal process slow, unreliable, and inaccessible to many people. Advosys solves this problem by moving the entire legal case management process online. Built as a secure web application, it allows advocates, clients, arbitrators, and administrators to manage cases, share documents, schedule hearings, track progress, and communicate all through one digital platform, without any office visit. Each user type has their own secure login and can only see information relevant to their role. The system has been tested with 959 real cases and confirmed to be fast, secure, and easy to use. Future plans include a mobile app, AI-based case analysis, and connection to government court systems.

Introduction

In India, most legal work still happens the traditional way on paper, in person, and without any organized digital system. When a person hires a lawyer (called an advocate), all the case details are written down in a physical register. Documents like court notices and affidavits are handed over in person. Hearing dates are told to the client by phone or in a face-to-face meeting. If the client wants to know what is happening with their case, they must physically go to the advocate's office or the court, sometimes just to hear that nothing has changed.

This offline way of working causes serious problems. Important documents get lost, information is not shared clearly between stakeholders, and there is no proper record of communication or decision-making. Advocates spend excessive time on paperwork instead of focusing on legal reasoning. For people living in rural areas, frequent travel to legal offices becomes costly and inefficient. Studies on digital judiciary systems highlight that lack of structured information systems reduces transparency and efficiency in legal workflows [21], [30].

With the rapid advancement of information and communication technologies, digital transformation has significantly improved efficiency across multiple domains such as healthcare, IoT-based monitoring, and intelligent predictive systems [9], [24]. For example, IoT-based systems for environmental monitoring and prediction demonstrate how real-time data collection and processing can enhance decision-making capabilities [2], [17], [18]. Similarly, advancements in machine learning, including data preprocessing and intelligent prediction

models, have improved system accuracy and performance in complex applications [3], [27], [31], [32].

Modern computing platforms such as cloud computing provide scalable infrastructure for handling large volumes of structured and unstructured data efficiently [13]. Additionally, developments in networking technologies and distributed systems ensure reliable data communication across platforms [11]. Security also plays a critical role in digital transformation, where encryption techniques, biometric authentication, and graphical password systems are widely used to protect sensitive data and ensure secure access [14], [19], [26].

Advosys is built to solve all of these problems at once. It is a web-based platform accessible from any phone or computer that moves the entire legal case management process online. Instead of visiting an office, a client can log in from home and see exactly what is happening with their case. Instead of keeping paper files, an advocate can manage all their cases in one organized digital workspace. Instead of coordinating by phone, all parties—advocate, client, arbitrator, and administrator—communicate through one secure platform with a complete written record of interactions.

The system works by giving each type of user their own secure account with a specific set of permissions. An administrator sees the full system overview, an advocate manages assigned cases, an arbitrator reviews evidence and records decisions, and a client tracks their case progress. This approach, known as Role-Based Access Control (RBAC), ensures that users only access relevant information. Advanced RBAC models and identity-based access systems have been widely studied for secure web-based environments [5], [10].

Furthermore, integrating intelligent data handling, secure communication, and scalable infrastructure into a unified system is essential for modern applications. Various interdisciplinary technological developments, including embedded systems, smart devices, and optimization-based models, highlight the importance of building efficient and adaptive platforms [15], [28]. By leveraging these advancements, Advosys aims to provide a robust, secure, and scalable legal management solution.

Literature Survey

Legal case management has been an active area of research, with several studies exploring digital systems, access control models, and court automation.

Tao and Zhang [1] developed a web-based legal case management system using J2EE technology, focusing on improving record management and workflow efficiency. However, their system lacked scalability and modern security features required for enterprise-level applications.

Acoba et al. [12] proposed a web-based judicial information system that demonstrated how digital platforms reduce paperwork and improve record accessibility. However, the system offered limited functionality and lacked integration with advanced technologies.

Singh [7] introduced an automated scheduling approach for judicial systems, showing that automation can reduce delays in case handling. However, the study focused only on scheduling rather than complete case lifecycle management.

Soundari et al. [25] developed an e-court management system supporting case tracking, document storage, and verdict recording. While effective for digitization, the system lacked advanced communication and security capabilities.

Scott and Thinyane [21] explored ICT-based judiciary systems, emphasizing improved transparency and accessibility, though their work remained largely conceptual. Similarly, Kesan et al. [30] highlighted the importance of e-Justice systems but did not provide detailed implementation frameworks.

Shen and Fan [5] proposed a context-aware RBAC model, and Wang et al. [10] introduced identity-based RBAC, both enhancing access control security in distributed systems. Saman and Haider [16] also demonstrated how ICT can streamline civil court management, though without detailed implementation.

Beyond legal systems, several studies highlight supporting technologies relevant to modern platforms. Research on IoT-based monitoring and prediction systems demonstrates efficient real-time data processing and system optimization [2], [17], [18]. Similarly, machine learning techniques, including preprocessing, inductive learning, and transformer-based models, have been shown to improve prediction accuracy and system intelligence [3], [27], [31], [32].

Advancements in networking and distributed systems contribute to reliable communication and system performance, as demonstrated in MANET-based studies [11]. Image processing and retrieval techniques also support efficient handling of multimedia legal evidence [22].

Security and authentication remain critical aspects of digital platforms. Studies on encryption techniques, multimodal biometric systems, and graphical password authentication highlight methods to enhance system security and protect sensitive data [14], [19], [26], [29].

Additionally, research in cloud computing and scalable architectures emphasizes efficient resource management and system deployment [13]. Emerging interdisciplinary innovations, including smart embedded systems and nano-electronic computing models, further demonstrate the evolution of intelligent and adaptive platforms [15], [28].
Other domain-specific applications such as healthcare analytics, environmental monitoring, and intelligent prediction systems reinforce the importance of integrating multiple technologies into a unified system for improved efficiency and usability [4], [8], [23], [24].

System Design
This section explains how Advosys is designed how users interact with it, how it is organized technically, and how it keeps data safe.

1. How the System Works
Fig. I shows the complete workflow of the Advosys platform. Every action in the system follows a clear sequence. The system starts with a login screen where all users' administrators, advocates, arbitrators, and clients sign in using their registered email and password. After logging in, the Super Administrator sets up the system by adding clients, advocates, and arbitrators, and configuring master data such as document types and financial year settings. Once setup is complete, cases are created either one at a time (Open Case) or in large batches imported from an Excel file (Bulk Upload). Each case then moves through a fixed workflow: documents are uploaded, parties are assigned, a hearing is scheduled, updates are recorded, and finally the case is marked as closed with the outcome archived. Every step is logged automatically, creating a complete and permanent record

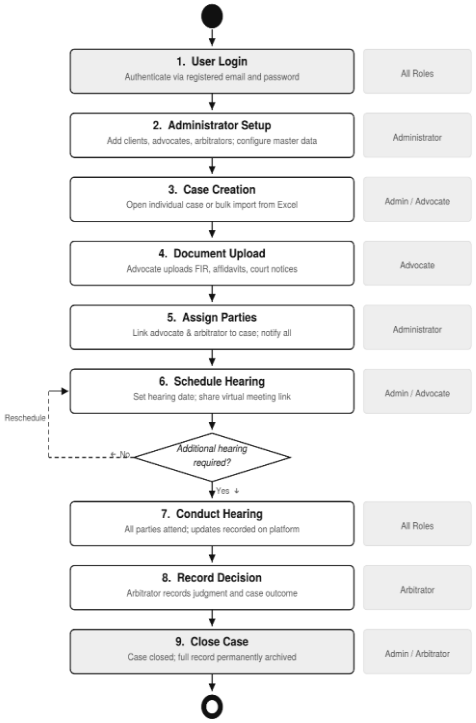

Fig 1: Advosys System Workflow - Steps process from Login to Case Closure

2. The Four User Roles
Advosys is built around four types of users. This is the core idea of the system different people need different tools and different levels of access. Table 1 describes each role in plain terms.

Table 1: The Four User Roles of Advosys

Role	Who This Is	What They Can Do
Administrator	The system manager — usually the head of the law firm or arbitration center	Adds and manages all users; monitors all cases on the platform; generates reports; configures the system; views all audit logs
Advocate	The lawyer handling the case	Creates new cases; uploads documents; schedules hearings; updates case status; sends messages to clients and arbitrators
Arbitrator	The judge or dispute resolver assigned to the case	Views the cases assigned to them; reads uploaded evidence and documents; records their decision; updates the case outcome
Client	The person who needs legal help	Checks the current status of their case; reads documents shared with them; receives automatic reminders about hearing dates; views their billing

3. Technical Architecture
Advosys is built in three layers, which is a standard and well-proven way to build web applications. The first layer is what the user sees the website interface, built with HTML, CSS, and JavaScript. It works in any browser on any device, including low-cost smartphones, which is important for reaching users in rural areas.
The second layer is the backend the part of the system that runs on a server and handles all the logic. It is built using ASP.NET, a widely trusted framework for building secure, large-scale web applications. When a user clicks a button, the backend checks whether they are allowed to

perform that action, processes the request, and sends back the result.
The third layer is the database where all the data is stored. Advosys uses PostgreSQL, a powerful database system that guarantees data is never lost or corrupted, even if the server crashes. It supports organizing data into separate tables for users, cases, documents, hearings, payments, and messages, all linked together in a structured way.

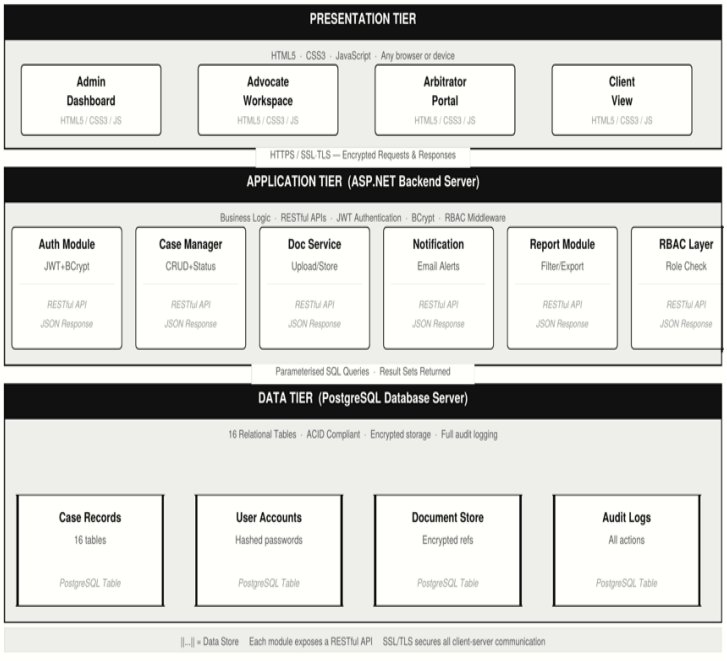

Fig 2: Technical Architecture

4. How the System Keeps Data Safe
Because legal data is private and sensitive it involves people's personal details, financial records, and confidential case information Advosys has multiple layers of security built in from the ground up.

- Secure Login Tokens: When a user logs in, the system creates a unique digital pass called a JSON Web Token (JWT). Every action the user takes is checked against this pass. If the pass is missing, expired, or changed, access is immediately blocked.
- Password Protection: Passwords are never stored as plain text. They are scrambled using a strong one-way method (BCrypt hashing) before being saved. Even if someone gained access to the database, they could not read any passwords.
- Encrypted Data Transfer: All information sent between the user's browser and the server is encrypted using SSL/TLS the same security standard used by banks. Nobody can intercept and read the data in transit.
- Safe Document Storage: Uploaded legal files are stored separately in a secure encrypted location. Only the file's basic details (name, type, date) are kept in the main database the actual file content is protected separately.

5. Database Design
The database is designed using an Entity-Relationship (ER) model. Think of it as a map showing all the different types of information the system needs to store and how they connect to each other. A case is linked to a client. A client is linked to documents. Document are linked to hearings. Every connection is clearly defined so the system can quickly find any piece of information it needs.

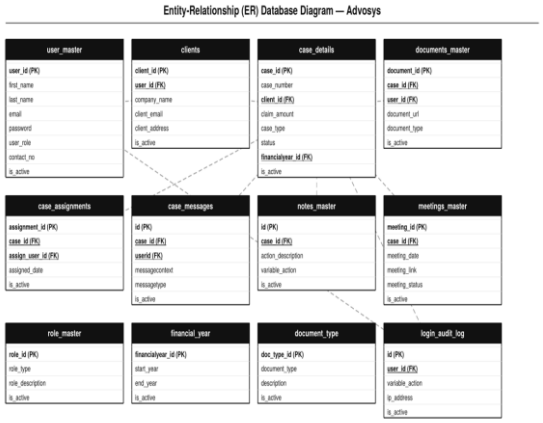

Fig 3: Database Structure

Implementation

This section shows the features of the Advosys platform, describes the technology choices made, and compares the new online process with the old offline one step by step.

1. Technology Choices

Table 2 lists every technology used in Advosys and explains in plain terms why each one was chosen.

Table 2: Technologies Used in Advosys

Layer	Technology Used	Why We Chose It
User Interface	HTML5, CSS3, JavaScript	Works in any web browser on any device — no app download needed. A user with a basic smartphone can access the full system.
Server / Backend	ASP.NET (Microsoft)	A trusted, secure framework used by large organizations worldwide. Handles all business logic and user requests reliably.
Database	PostgreSQL	Ensures data is never lost or corrupted. Supports complex queries across all 16 tables efficiently, even with thousands of records.
Login Security	JWT (JSON Web Token)	Each user gets a unique digital pass when they log in. Every action is verified against this pass — no unauthorized access possible.
Password Storage	BCrypt Hashing	Passwords are scrambled using a one-way formula. Even if the database is compromised, no password can ever be read.
Data Encryption	SSL / TLS	All data sent between the user's browser and our server is encrypted — like a sealed envelope that only the recipient can open.
API Design	RESTful APIs	A clean, standard way for the frontend and backend to communicate, making the system easy to extend in the future.

2. The Login Page

The Advosys login screen the first thing every user sees. The design is deliberately simple: the Advosys logo, an email field, a password field, and a Sign In button. There is also a 'Forgot password?' link for users who need to reset their password. The simplicity is intentional anyone who can use a smartphone should be able to log in without needing training. Behind the scenes, when the user clicks Sign In, the system checks their credentials, identifies their role, and sends them directly to the correct dashboard for their role

3. The Administrator Dashboard

Once logged into the application the Super Administrator sees the following. At the top of the screen are three large summary boxes showing the most important numbers: Total Cases (959), Open Cases (932), and Closed Cases (16). In the offline system, getting these numbers would require manually counting physical files. Here, they update automatically in real time. Below the summary, a
full case register table shows every case with its case number, agreement number, client name, claim amount, opposition party name, registration date, and current status. The search bar at the top right lets the administrator find any specific case instantly by typing any detail.

4. The Navigation Menu

The left-side navigation menu is for the Administrator role. It is organized into clear sections. Under Masters, the SAI Master Dropdown gives access to: User Master (manage all system accounts), Advocate/Arbitrator (add legal professionals), Client Master (manage client accounts), Document Type Master (define what kinds of documents the system accepts), Financial Year (set the current financial period), and Holiday Master (record official holidays that affect hearing scheduling). The Reports section leads to Award Service Reports. The Case Records section gives access to Case Details, Transactional Logs, and Login Transactional Logs. A client who logs in sees a completely different, much simpler menu only their own case details and no administrative controls. Advosys was tested thoroughly before being used with real cases. This section describes what was tested and what the results showed.

Testing Result

Advosys was tested thoroughly before being used with real cases. This section describes what was tested and what the results showed.

1. Performance Testing

The system was tested with 959 real case records 932 open and 16 closed. Even with this many records, every search and filter action completed in under one second. The case register table, which spans 96 pages of results, loaded quickly and smoothly. The bulk upload feature was tested by importing a large batch of cases from an Excel file a process that would have taken hours of manual data entry was completed in seconds.

2. Security Testing

All four role boundaries were tested by attempting to access restricted areas with the wrong type of account. For example, a client account was used to try to access Administrator functions. In every test, the system correctly blocked access and returned an error. No information from one role was ever visible to another role. Password storage was verified to be properly protected passwords cannot be read from the database. All data connections were confirmed to use encryption. Every action performed during testing was correctly recorded in the audit log.

3. Comparison with Other Systems

Table III compares Advosys against five other legal management tools on the nine features most important for an Indian legal office moving from offline to online. Advosys is the only system in this comparison that was specifically designed to help an offline legal operation become digital. It is also the only one that covers all nine features including support for arbitrators, a free cost model, and complete audit logs in a single platform.

Table 3: Feature Comparison: Advosys vs. Five Other Legal Management Tools

Feature	Advosys	Legal Files	Clio	MyCase	CaseFox	Lawcus
Role-Based Access Control	✓	✗	Partial	✗	✗	✗
Offline → Online Migration	✓	✗	✗	✗	✗	✗
Real-Time Case Tracking	✓	✓	✓	✓	✓	✓
Encrypted Communication	✓	✗	✗	Partial	✗	✗
Arbitration Support	✓	✗	✗	✗	✗	✗
Automatic Notifications	✓	✗	Partial	✗	✗	✓
Financial Management	✓	Partial	✓	✓	✓	Partial
Full Audit Logs	✓	✗	Partial	✗	✗	✗
No Subscription Cost	✓	✗	✗	✗	✗	✗

4. User Testing

The platform was tested in four stages. First, each individual feature login, case creation, document upload, notification sending was tested on its own to confirm it worked correctly. Second, the complete flow from client registration to case closure was tested end to end to confirm all parts work together. Third, the system was tested under heavy load to check performance. Finally, actual advocates and administrative staff used the system and gave feedback. They confirmed the platform is straightforward to use, reduces their daily workload significantly, and is a major improvement over working with paper files.

Conclusion And Future Scope

Legal work in India has relied on paper, physical offices, and face-to-face communication for too long. This creates problems that affect everyone. Clients who cannot get timely information, advocates buried in administrative work, arbitrators who cannot access case files remotely, and administrators with no way to see the full picture without being in the office.

Advosys changes this completely. It takes every step of the legal case management process and moves it online in a way that is secure, organized, and simple enough for anyone to use. Each user gets a role-specific account that shows them exactly what they need. All documents are stored

safely. All communication is recorded. All case history is permanently preserved. The system has been validated with real cases and confirmed to be fast, secure, and practical. Advosys does not try to replace lawyers, it gives them and their clients a better, more transparent, more accessible way to work.

Future improvements of Advosys may focus on expanding the system's scalability, security, and integration with broader judicial infrastructure. The platform can be deployed on cloud-based environments to support a larger number of users and improve system availability across different regions. In addition, blockchain-based mechanisms may be explored for secure and tamper-resistant storage of legal documents and case records, which can strengthen data integrity and trust in digital legal processes. Integration with existing government e-court platforms could also be considered so that case updates and hearing schedules can be synchronized automatically. Such developments would help extend the system from a standalone legal management platform to a more connected digital solution supporting the evolving needs of the judicial ecosystem in India.

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