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DEVELOPMENT OF SOFTWARE FOR AN INTEGRATED CLIENT INTERACTION MANAGEMENT SYSTEM FOR A LEGAL COMPANY

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Анотація

У роботі запропоновано підхід до розробки інтегрованої end-to-end системи керування взаємодією юридичної компанії з клієнтами, що об'єднує прийом звернень (intake), призначення відповідального юриста, ведення кейсу, планування зустрічей у календарі та формування звітності. Сформовано вимоги до бізнес-процесу «від звернення до закриття кейсу», визначено ролі користувачів і межі доступу на основі RBAC, а також базові політики безпеки для захисту конфіденційних даних клієнтів. Запропонована модульна архітектура з уніфікованими API та журналом аудиту дій забезпечує простежуваність рішень, контроль змін і можливість оцінки KPI до/після впровадження (час обробки звернень, прострочення, продуктивність).

Ключові слова: юридична компанія, взаємодія з клієнтами, intake, керування кейсами, календар зустрічей, звітність, KPI, рольовий доступ, журнал аудиту, конфіденційність даних.

Abstract

This paper proposes an approach to developing an end-to-end integrated system for managing a legal company's client interactions, covering request intake, assignment of responsible lawyers, case management, meeting scheduling via calendar integration, and operational reporting. The study formalises requirements for the full workflow 'from request submission to case closure', defines user roles and access boundaries using role-based access control, and outlines baseline security policies for protecting confidential client data. A modular architecture with unified APIs and an audit log is designed to ensure traceability, accountability for changes, and consistent data across modules. An evaluation plan is proposed to compare key performance indicators before and after deployment, including request handling time, overdue cases, and lawyer productivity.

Keywords: legal services, client relationship management, intake, case management, calendar integration, reporting, KPI, role-based access control, audit logging, data confidentiality.

Legal departments and small legal firms often operate with fragmented tooling: requests arrive via email or messaging platforms, assignments are tracked in spreadsheets, meetings are arranged manually, and reporting is compiled ad hoc. Such fragmentation reduces transparency, increases the risk of missed deadlines, and makes it difficult to consistently protect confidential client information and to evidence compliance [1, 2].

The objective of this work is to design and implement a minimum viable product (MVP) of an integrated client-interaction management system for a legal firm that spans the end-to-end process: requests → lawyers → meetings → reports. The object of study is the comprehensive process of interaction between a legal department and its clients, while the subject is the architectural and software solutions for integrating intake, case management, calendar and meeting-scheduling, and reporting modules. The proposed system aims to increase operational visibility, reduce delays, and provide measurable improvements in key performance indicators (KPIs) [1].

SYSTEM REQUIREMENTS AND BUSINESS PROCESS

Requirements are derived by describing the business process 'from request submission to case closure' using process modelling and explicit state transitions. The process begins with request registration and classification, continues with triage and assignment to a responsible lawyer, includes planning and conducting meetings, producing legal deliverables, coordinating approvals, and ends with case closure and

controlled retention of case artefacts. Modelling the workflow as a lifecycle with clear state boundaries allows the system to compute KPIs from timestamped transitions rather than subjective reporting [2, 4].

The intake module receives requests via a web form or manual entry, captures metadata (client identity, category, urgency, confidentiality label), performs duplicate detection, and routes items in accordance with policies (skill area, workload, priority, conflict checks). The case-management module supports the following states (opened, assigned, in progress, awaiting client, scheduled, closed), task lists, linked documents, and a comprehensive activity timeline of actions and decisions, including timestamps and responsible parties. These elements form the 'single source of truth' for case progress and accountability [1, 2].

The calendar/meeting module integrates with an external calendar provider to create and update meeting events, enforce availability constraints, and link meetings to cases so that communications are not separated from the case record. Reporting aggregates operational data into monthly and yearly summaries and supports KPI computation, including average handling time, overdue rate, workload distribution, and throughput per lawyer. The reporting layer is designed to support both management-level summaries and drill-down to individual cases to explain anomalies [4-6].

ARCHITECTURE AND INTEGRATION APPROACH

A modular architecture is proposed to avoid tight coupling while preserving end-to-end traceability. The core domain entities are Client, Request, Case, Assignment, Meeting, and Report. Each module exposes a versioned API and publishes domain events (e.g., RequestCreated, LawyerAssigned, MeetingScheduled, CaseClosed) that trigger downstream updates. This integration style supports incremental delivery of the MVP, reduces integration risks when adding new channels, and provides a consistent audit trail across modules [1, 2].

For an MVP, a shared relational database can be used with clear schema boundaries per module, while the service layer enforces invariants and consistent identifiers across the workflow. As the system evolves, the same domain model can be migrated towards service-owned data stores with an event bus and read models for reporting. Calendar integration is implemented through an adapter layer that encapsulates the external provider API, normalises time zones, and uses idempotent update patterns to prevent duplicate events when retries occur [2, 6].

The system defines user roles and responsibility boundaries: administrator (configuration and user management), lead/partner (assignment policies and KPI oversight), lawyer (case execution), assistant (intake support and scheduling), and auditor (read-only access to logs and reports). The API surface is designed with least-privilege access, explicit scopes, and consistent error handling to support safe integrations with future modules such as document management or e-signature [3, 4].

SECURITY, PRIVACY, AND AUDITABILITY

Given the sensitivity of legal data, security is treated as a first-class requirement. Access is governed by role-based access control (RBAC) with least-privilege permissions for high-impact actions, including viewing confidential cases, exporting reports, and modifying assignments. Authorisation decisions consider both role and case attributes (confidentiality label, client group, conflict flags). This approach reduces the risk of accidental disclosure and supports compartmentalisation within the legal department [3, 4, 7].

An immutable, tamper-evident audit log records who performed each action and when, including reads of confidential records, state changes, meeting scheduling, and exports. Audit entries include the actor identity, action, object reference, timestamp, and context (e.g., device or session), thereby enabling internal investigations and providing compliance evidence. Secure software development practices are applied throughout the lifecycle, including threat modelling, dependency management, secure defaults, and periodic review of critical paths [5, 6].

Privacy constraints are addressed through data minimisation, purpose limitation, and controlled retention: only necessary client attributes are stored, exports are restricted, and retention schedules are applied to closed cases. Where personal data is processed, the design anticipates GDPR-style requirements for lawful processing, access control, breach response, and handling of user rights [7].

REPORTING AND KPI EVALUATION

Reporting is designed as a read-optimised layer that aggregates events and case states into metrics. Monthly and yearly reports include intake volume, distribution by category, average and percentile handling times, proportion of overdue cases, workload distribution across lawyers, and throughput (closed cases per period). KPIs are computed from timestamped transitions (opened→assigned→scheduled→closed), thereby improving measurement reliability relative to manual spreadsheets. [1, 2].

To evaluate impact, a before-and-after comparison is proposed, using historical baselines from existing sources (email logs, spreadsheets) and the system's own audit and event data from post-deployment periods. The evaluation considers not only mean values but also tail behaviour (e.g., the proportion of cases exceeding service-level targets) and stability of performance across categories. Qualitative feedback from users complements quantitative measures by focusing on usability, reduction in context switching, and perceived control over workloads [1, 4-6].

IMPLEMENTATION NOTES AND EXPECTED RESULT

The expected result is a working MVP that demonstrates unified client and case registries, automated assignment workflows, meeting scheduling, and reporting with controlled exports. The prototype prioritises correctness of the end-to-end flow, consistent identifiers across modules, and a minimal but robust security baseline (RBAC, audit logging, encrypted transport, and secure configuration) [5, 6].

Future work includes extending integrations (document repository, templates, e-signature), strengthening privacy controls (field-level encryption, more granular policies for external counsel), and validating KPI improvements on real operational datasets. The architecture also allows the introduction of rule-based or AI-assisted triage for intake categorisation and workload balancing, provided that explainability and audit requirements are preserved [1, 3, 7].

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