

Certification Tracking and Management Portal - Full System Design

This document provides a detailed design for a Certification Tracking and Management Portal. The system allows employees to manage their certifications and submit quarterly updates, while administrators can track, review, and generate reports.

Core Modules

- Authentication & User Management: Employee ID, Name, Email, Department, Role (Admin/Employee/Manager), Password/SSO, Profile management.
- Certification Management: Certification ID, Name, Provider, Level, Issue Date, Expiry Date, Certificate Upload (PDF/Image), Status (Planned/In Progress/Completed/Expired).
- Quarterly Submission & Tracking: Quarter (Q1–Q4), Year, Submission Status (Pending, Submitted, Reviewed, Approved), Submission Date.
- Notifications & Reminders: Automated quarterly submission reminders, expiry alerts, admin approval/rejection notifications.
- Reports & Dashboard: Admin dashboard (organization-wide summary), Employee dashboard (personal summary), expiring certifications, submission compliance %, export reports (Excel/PDF).
- Audit & History: Track all changes, certification history log.

Frontend (Angular)

- Login Page – JWT Auth.
- Dashboard – Admin (summary, filters), Employee (personal certifications).
- Certification List – CRUD operations with sorting, filtering, searching.
- Add/Edit Certification Form – Validations, reactive forms, file upload component.
- Quarterly Submission Page – Quarter/year dropdown, checklist submission, status indicator.
- Reports Page – Charts via ngx-charts/Chart.js, export to PDF/Excel.
- Notifications Panel – Submission deadlines, expiring certification alerts.

Backend (Spring Boot)

- Entities: User, Certification, QuarterlySubmission, Notification.
- REST APIs: /api/auth/login, /api/users, /api/certifications, /api/submissions, /api/notifications, /api/reports.
- Services: CertificationService, SubmissionService, NotificationService, ReportService.
- Email Service: Spring Mail/AWS SES integration.
- Scheduler: Spring Scheduler/Quartz for periodic reminders.

Workflow Example

- Quarter Start – System emails all employees: 'Update your certifications for Q3'.
- Employee Login – Updates certifications, uploads documents, submits.
- Admin Review – Admin reviews and approves/rejects submissions.
- Reporting – Export reports with compliance %, expiring certifications.

- Reminder – Automatic alerts 30 days before expiry.

Tech Suggestions

- Frontend: Angular 17, TailwindCSS, Chart.js.
- Backend: Spring Boot 3, Spring Security (JWT), JPA/Hibernate.
- Database: PostgreSQL/MySQL.
- File Storage: AWS S3/local file system.
- Email: Spring Mail/AWS SES.
- Scheduler: Spring Scheduler/Quartz.

Database Schema (ER Diagram)

