

Proposed Solutions-Template

Date	24 JUNE 2025
Team ID	LTVIP2025TMID29797
Project Name	workforce administration solution (dev)
Maximum Marks	

♦ 1. Core HR & Employee Data Management

Solution:

Develop a centralized, role-based HR data repository with APIs for CRUD operations.

Key Features:

- Employee lifecycle management (hire-to-retire)
- Position and organizational hierarchy mapping
- Document storage (contracts, certifications)
- Role-based access control (HR, managers, employees)

Tech Stack Suggestion:

- Backend: Node.js or .NET Core
- Database: PostgreSQL or Microsoft SQL Server
- APIs: RESTful with OpenAPI spec

♦ 2. Time & Attendance Management

Solution:

Build a time-tracking module with geolocation support and rules-based attendance validation.

Key Features:

- Clock-in/clock-out (biometric, mobile, kiosk support)
- Timesheet approval workflows

- Overtime and compliance rules engine
- Integration with leave and scheduling systems

Tech Stack Suggestion:

- Frontend: React Native (for mobile clock-ins)
- Rules Engine: Camunda or custom engine
- Sync: Bi-directional sync with external payroll or ERP

♦ **3. Workforce Scheduling**

Solution:

Create a smart scheduling engine for shift-based or project-based staffing.

Key Features:

- Shift templates and drag-and-drop calendar
- Skills- and availability-based assignment
- Conflict resolution (overtime, double-booking)
- Notifications for shift changes or gaps

Tech Stack Suggestion:

- Scheduling engine: Python backend with constraint solver (e.g., OptaPlanner)
- UI: React calendar with real-time sync
- Notification: Firebase / Twilio for SMS and email alerts

♦ **4. Employee Self-Service Portal**

Solution:

Develop a responsive web and mobile app for employees to manage their HR needs.

Key Features:

- Personal data updates
- View payslips and time-off balance
- Submit leave or travel requests
- Access company policies and training

Tech Stack Suggestion:

- Frontend: Vue.js or React
- Backend: GraphQL APIs for modular access
- Auth: OAuth 2.0 + SSO

♦ **5. Leave & Absence Management**

Solution:

Implement a configurable leave policy engine integrated with calendars and payroll.

Key Features:

- Multi-policy configuration (e.g., sick, vacation, FMLA)
- Accruals, carryover, and approval workflow
- Calendar sync (Google, Outlook)
- Auto-flag attendance impact

Tech Stack Suggestion:

- Workflow engine: Camunda or Temporal
- Integration: iCal / Microsoft Graph for calendars
- Leave policies: JSON-configured rules model

◆ 6. Compliance & Audit Trail

Solution:

Add audit-ready logging and compliance configurations across all HR modules.

Key Features:

- GDPR and labor law compliance tagging
- Role-based visibility and data access logs
- Automated alerts for expiring documents (visas, licenses)
- Exportable audit trail for authorities

Tech Stack Suggestion:

- Logging: ELK Stack (Elasticsearch, Logstash, Kibana)
- Monitoring: Prometheus + Grafana
- Data encryption: AES-256 in DB + TLS

◆ 7. Payroll Integration Layer

Solution:

Build connectors for major payroll platforms or create a staging area for payroll processing.

Key Features:

- Pre-payroll report generation
- Sync attendance, overtime, bonuses
- Export formats for ADP, Paychex, etc.
- Audit before submission

Tech Stack Suggestion:

- API Layer: Middleware with transformation logic (e.g., MuleSoft or custom Node.js middleware)
- Export Engine: CSV/JSON/XLS generator with validation rules

♦ 8. Analytics & Reporting Dashboard**Solution:**

Develop a real-time reporting dashboard with KPIs for workforce management.

Key Features:

- HR metrics (headcount, attrition, leave usage)
- Time & attendance dashboards
- Custom report builder for managers
- Export and schedule reports

Tech Stack Suggestion:

- BI Tool: Metabase / Apache Superset / Power BI
- Data Layer: Star schema for workforce data mart
- Reports: Embedded dashboards with RBAC

Cross-Cutting Concerns

Concern	Solution
Security	OAuth2.0, RBAC, encryption in transit & at rest
Scalability	Containerized services (Docker + Kubernetes)
Integration	REST/GraphQL APIs, webhooks, message queues (Kafka/RabbitMQ)
CI/CD	GitHub Actions / Jenkins pipelines
Testing	Unit + API + end-to-end tests (Postman + Cypress)