Solution Architecture

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

1. Architecture Layers

A. Presentation Layer (User Interface)

- Web Portals & Mobile Apps (Responsive UI)

    - Employee Self-Service (ESS)

    - Manager Self-Service (MSS)

    - Admin Console

- **Tech Stack:** React.js / Angular / Flutter for mobile

B. Application Layer (Business Logic)

- **Microservices handling:**

    - Employee Onboarding / Offboarding

    - Leave & Attendance

    - Organization Hierarchy Management

    - Benefits & Compensation

    - Timesheets / Scheduling

- **Tech Stack:**

    - Node.js / Spring Boot (Java)

    - REST/GraphQL APIs

○ Message Queues (Kafka / RabbitMQ)

C. Integration Layer

- Enterprise Integration Bus (EIB) or iPaaS (MuleSoft, Boomi)

- **APIs to integrate with:**

  ○ Payroll Systems (ADP, Workday, etc.)

  ○ ERP (SAP, Oracle)

  ○ Compliance/Tax Services

  ○ Identity Providers (SSO/OAuth)

D. Data Layer

- **Databases:**

  ○ **Relational:** PostgreSQL / MS SQL Server

  ○ **NoSQL:** MongoDB for flexible document structures

- **Data Lake / Warehouse:** Snowflake / BigQuery for analytics

- Master Data Management (MDM) for workforce data consistency

E. Analytics & Reporting

- Embedded BI (Power BI / Tableau / Looker)

- **Prebuilt dashboards for:**

  ○ Attrition rates

  ○ Workforce distribution

  ○ Overtime trends
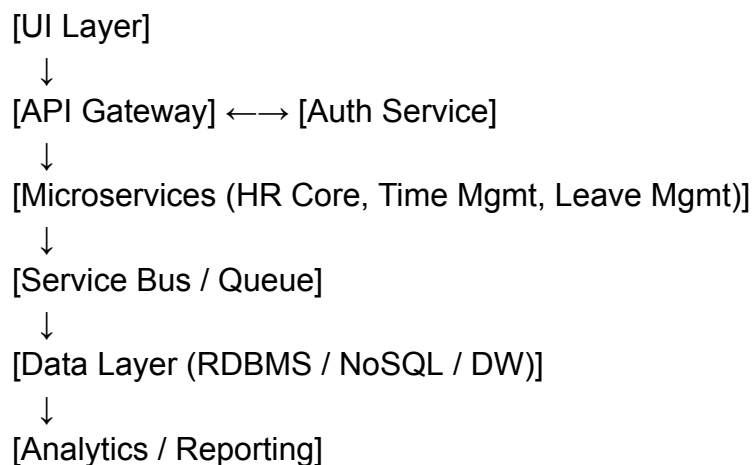
F. Security & Compliance

- Role-Based Access Control (RBAC)

- Data encryption (at rest and in transit)

- GDPR / HIPAA / SOC2 compliance checks

🔄 2. Dev Environment Considerations

Aspect	Solution
CI/CD	GitHub Actions / Jenkins / Azure DevOps
Containerization	Docker
Orchestration	Kubernetes / OpenShift
Environment	Dev, QA, UAT — separated with feature toggling
Test Automation	Selenium, Postman, JUnit
Logging & Monitoring	ELK Stack / Grafana + Prometheus

3. High-Level Component Diagram

[UI Layer]
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[API Gateway] ⟵⟶ [Auth Service]
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[Microservices (HR Core, Time Mgmt, Leave Mgmt)]
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[Service Bus / Queue]
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[Data Layer (RDBMS / NoSQL / DW)]
 ↓
[Analytics / Reporting]

🎯 4. Key Features to Include in Workforce Admin Dev

- Modular HRIS features for flexibility in development

- DevOps-enabled CI/CD with rollback and environment promotion

- Mock Services for external system integration

- Testing Harness for simulated workforce data