

34. Workflow Documentation

Admission Workflow:

- Application received
- Document verification
- Seat availability check
- Admission number generation
- Profile creation
- Parent notification
- Parallel activities (ID generation + roster update)

Examination Workflow:

- Exam schedule creation
- Conduct exam
- Evaluate papers
- Enter marks
- Generate report cards
- Notify parents

35. Component Diagram

Architecture Layers:

1. Presentation Layer (Angular/React)
2. Business Layer (Spring Boot)
3. Service Layer
4. Repository Layer
5. Database Layer (PostgreSQL)
6. Infrastructure Services (Backup, Logging, Monitoring)

36. Deployment Diagram

Production Setup:

Client Tier:

- Desktop Browser
- Mobile Browser

Web Server:

- Nginx Load Balancer

Application Server:

- Tomcat Cluster (2 Nodes)

Database Server:

- PostgreSQL Primary + Replica

Storage:

- File Storage for PDFs
- Backup Storage (30-day retention)

37. Design Document – Design Decisions

Architecture Decision:

Three-tier layered architecture with RESTful APIs.

Reasons:

- Separation of concerns
- Scalability
- Maintainability
- Security
- Cloud readiness

Security Design:

- JWT Authentication
- Role-Based Access Control
- Password hashing (BCrypt)
- HTTPS enforced

Database Design:

- Normalized up to 3NF

- Foreign key constraints
- Indexed fields

Scalability:

- Load balancing
- Application cluster
- Database replication

Backup Strategy:

- Daily automated backup
- 30-day retention