Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	31/10/25
Team ID	NM2025TMID09014
Project Name	Optimization User, group and role management with access control and workflow
Maximum marks	4 Marks

Technical Architecture

The deliverable includes the architectural diagram and detailed information as per the tables below.

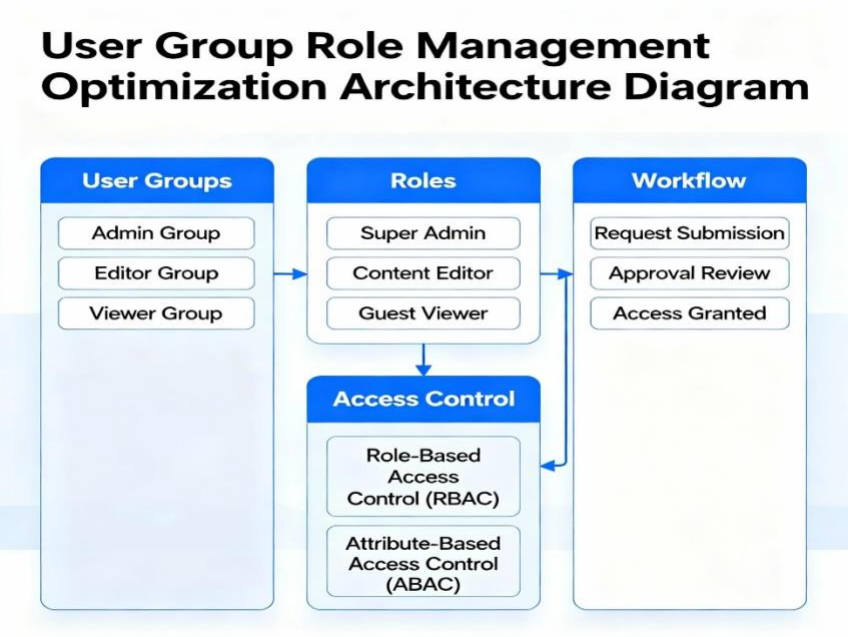

Table 1: Components & Technologies

S.NO	Component	Description	Technology
1	User Interface	Admin and users interact via a web dashboard for managing users,	React.js / HTML/ CSS

		roles, and workflows.	
2	Authentication& Authorization	Validates users and manages role-based access using secure tokens.	Node.js with JWT
3	Role Management	Create and assign roles with specific access permissions.	Express.js , Sequelize
4	Group Management	Organize users into logical groups for workflow routing and permission inheritance.	MySQL(Group Table)
5	Access Control Engine	Controls access to modules based on roles and permissions.	Node.js middleware
6	Workflow Engine	Automates approval flows and tracks process states.	Node.js Workflow Logic
7	Notification Service	Sends alerts or approval notifications to users/managers.	Nodemailer / Firebase Cloud Messaging
8	Database	Stores users, roles, groups, and workflow data.	MySQL
9	Cloud Infrastructure	Application hosted on cloud for availability and scalability.	AWS / Azure Cloud
10	API Layer	T APIs expose backend functions for frontend integration.	Express.js API
11	File Storage (Optional)	Stores user-related configuration or export files.	AWS S3 / Cloud Storage

Table 2: Application Characteristics

S.NO	Characteristics	Description	Technology
1	Open Source Framework	Built using open-source technologies to ensure flexibility.	React.js, Node.js
2	Security Implementation	Role-based access control (RBAC), encrypted tokens, and ACLs.	JWT, bcrypt.js
3	Scalable Architecture	Microservice-ready and horizontally scalable	Node.js + AWS
4	Availability	Deployed on cloud infrastructure for 24/7 uptime.	AWS Cloud Hosting
5	Performance	Optimized API calls, caching, and efficient queries.	Sequelize ORM, Redis (optional)
6	Reliability	Continuous monitoring and automated backup of user data.	CloudWatch / PM2
7	Maintainability	Modular architecture with reusable role-based components.	MVC Design Pattern