Project Design Phase – II

Technology Stack (Architecture & Stack)

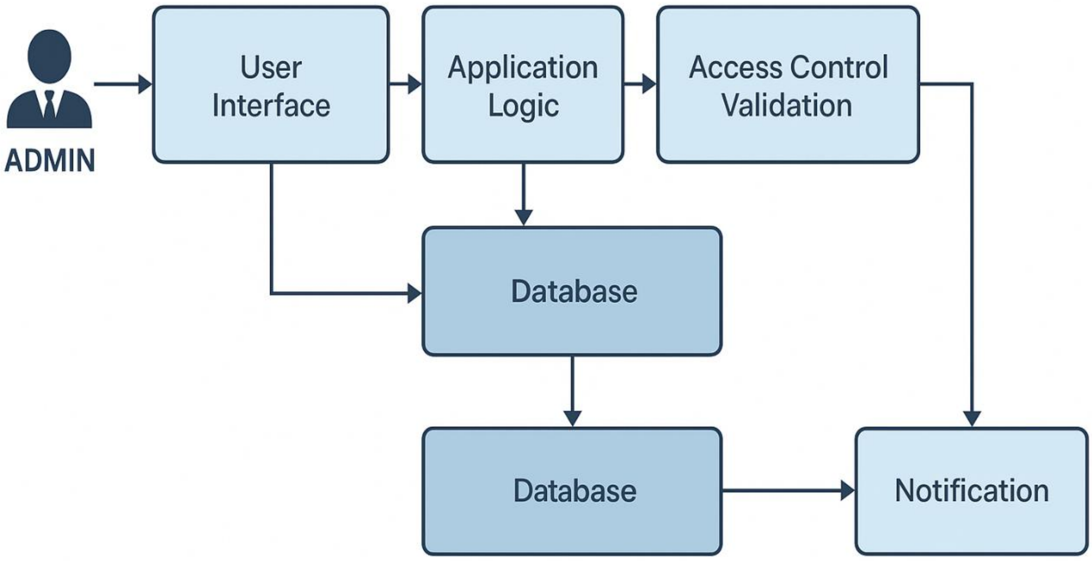
Date	1 November 2025
Team ID	NM2025TMID00630
Project Name	Optimizing User, Group, and Role Management with Access Control and Workflows
Maximum Marks	4 Marks

Technical Architecture:

The deliverable includes an architectural diagram representing the system workflow and its components. The architecture outlines how different modules interact to manage users, groups, and roles efficiently while maintaining access control and workflow automation.

Reference:

https://developer.ibm.com/patterns/secure-user-management-with-role-based-access-control/



Guidelines:

- Include all main processes as separate logic/technology blocks.
- Show infrastructure layers (local or cloud).
- Indicate connections to external APIs or third-party integrations.

- Include data storage components and services.
- Show workflow engine or automation logic.

Table – 1: Components & Technologies

S.No	Component	Description	React.js / HTML / CSS / JavaScript
1	User Interface	Admin and authorized users interact through a secure web dashboard for managing users, groups, and roles.	Node.js / Express.js
2	Application Logic – 1	Handles user creation, editing, and deletion logic.	Role-Based Access Control (RBAC) logic using Node.js
3	Application Logic – 2	Implements access control validation and permission checks before updates.	Workflow engine (e.g., n8n / custom Node.js module)
4	Application Logic – 3	Workflow automation module for approval processes and notifications.	MongoDB / MySQL
5	Database	Stores user, group, role, and workflow data securely.	AWS RDS / MongoDB Atlas
6	Cloud Database	Manages centralized storage for scalable data handling.	AWS S3 / Local File System
7	File Storage	Stores configuration files, logs, and exported audit reports.	SendGrid / Gmail API
8	External API – 1	Integration with email service for approval notifications.	REST API / OAuth 2.0
9	External API – 2	Optional integration with organization’s HR or identity management system.	Python (Scikit-learn) / Not applicable for basic version
10	Machine Learning Model	(Optional) Suggests access recommendations based on usage behavior.	AWS / Azure / Google Cloud
11	Infrastructure (Server/Cloud)	Hosted on a secure, scalable cloud platform for continuous operation**.**	AWS / Azure / Google Cloud

Table – 2: Application Characteristics

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Uses open-source technologies for flexibility and cost efficiency.	React.js, Node.js, MongoDB
2	Security Implementations	Role-Based Access Control (RBAC), encrypted authentication, and secure API tokens.	JWT, bcrypt, HTTPS
3	Scalable Architecture	Microservice-ready architecture supporting horizontal scalability.	Docker / Kubernetes (optional)
4	Availability	Ensures 24/7 access for administrators through cloud hosting and redundancy.	AWS Cloud Hosting
5	Performance	Optimized for quick response during role validation and workflow approvals.	Indexed databases, async Node.js operations
6	Reliability	Ensures accurate access checks and consistent workflow triggers.	Server monitoring, audit logs