Project Design Phase
Solution Architecture

Date	29 june 2025
Team ID	LTVIP2025TMID59412
Project Name	ResolveNow
Maximum Marks	4 Marks

Solution Architecture:

ResolveNow: Online Complaint Registration and Management System

Solution Architecture is the structured process of designing the most effective technology blueprint to bridge the gap between the real-world problem of inefficient complaint management and a secure, scalable, and user-centric web-based platform.

Goals of the Solution Architecture:

- **Identify the best tech stack** (React.js, Node.js, MongoDB) to solve existing issues with manual or outdated complaint handling processes.

- **Clearly define the structure and behavior** of the system—from user interfaces and agent/admin dashboards to backend workflows and real-time communications.

- **Break down development into key phases**, including user registration, complaint lifecycle management, agent interaction, admin oversight, and notification services.

- **Provide detailed specifications** for components (frontend, backend, APIs, database), ensuring clear communication across all project stakeholders and development teams.

Architecture Highlights:

- **Frontend (Client Layer):**
  - Built with **React.js** using **Bootstrap/Material UI** for responsive design.
  - Uses **Axios** for HTTP communication with backend APIs.
  - Provides interfaces for Users, Agents, and Admins.

- **Backend (Server Layer):**
  - Developed using **Node.js** with **Express.js** for handling RESTful APIs.
  - Handles routing, authentication, business logic, and real-time messaging.

- **Database (Data Layer):**

- Utilizes **MongoDB** for flexible and scalable data storage.
- Stores user accounts, complaints, statuses, agent responses, and feedback.

- **Communication:**
  - Real-time interaction supported via WebSockets (e.g., Socket.io).
  - Automated email/SMS alerts integrated via notification services (e.g., Twilio, Nodemailer).

- **Security:**
  - JWT-based user authentication.
  - Role-based access control (User, Agent, Admin).
  - HTTPS, input validation, and file upload sanitization.

- **Scalability and Maintenance:**
  - Modular architecture ensures ease of feature expansion.
  - Cloud-deployable with CI/CD support for updates and testing.

Architecture diagram:

```
            ┌──────────────────────────┐
            │  User Registration/Login │
            └──────────────────────────┘
                        ▲
            ┌──────────────────────────┐
            │     Submit Complaint     │
            └──────────────────────────┘
                        ▲
            ┌──────────────────────────┐
            │   Complaint Saved in DB  │
            └──────────────────────────┘
              ▲         ▲         ▲
┌──────────────────┐ ┌──────────────────┐ ┌──────────────────────────────┐
│ Admin Reviews &  │ │ Agent Communicates│ │ User Receives                │
│ Assigns          │ │ with User         │ │ Updates/Notifications        │
└──────────────────┘ └──────────────────┘ └──────────────────────────────┘
                        ▲
            ┌──────────────────────────┐
            │   Complaint Resolution   │
            └──────────────────────────┘
                        ▲
            ┌──────────────────────────┐
            │    Feedback Submitted    │
            └──────────────────────────┘
```