

Architecture Overview

System Architecture Style

The system uses a **Layered Architecture** to separate concerns and manage complexity. This structure ensures scalability, modularity, and ease of maintenance.

Layers:

1. Presentation Layer

- Responsible for user interactions through web or mobile interfaces.
- Interfaces include:
 - Customer Web Interface
 - Shop Owner Portal
 - Government Dashboard
 - Admin Control Panel

2. Application Layer (Backend API)

- Handles all business logic and orchestration between frontend, data layer, and external APIs.
- Key functions:
 - User Authentication & Authorization
 - Shop Registration Management
 - Complaint Handling System
 - Review & Rating System
 - Notification Management
 - Admin Tools for Verification & Flagging

3. Data Layer

- Centralized database that stores all structured data for the system.
- Entities include:
 - Users
 - Shops
 - Complaints
 - Reviews

- Verification Logs

4. External Services Layer

- Integration with third-party services:
 - Messaging Service (e.g., WhatsApp API, Email Gateway, SMS Gateway)
 - AI Complaint Filtering System

High-Level Architecture Diagram Description

The following components and interactions are represented:

- **Frontend Interfaces** send requests to the **Backend API**.
- **Backend API** interacts with:
 - The **Database** for persistent storage.
 - The **External Services** for sending messages and processing AI filtering.
- **Authentication Gateway** to secure access to backend services.

Responsibilities of the Backend API

- Expose RESTful endpoints for the frontend.
- Implement role-based access control (customers, shop owners, government, admin).
- Coordinate data transactions between users and the database.
- Integrate notification system to send alerts.
- Interface with AI-based systems to flag complaints.

This layered model ensures that changes in one layer (e.g., UI) do not directly affect others (e.g., business logic or data schema).