

E-Challan Project - Remaining Tasks

1. Frontend Development (HTML/JS/CSS)

- Payment Integration UI

Create a dedicated page or modal for paying challans. Connect it to the '/api/payment' endpoint and handle success/failure states.

- Appeals Interface

Build a form for users to submit appeals against challans (Reason, Evidence). Add a view to track appeal status.

- User Profile Dashboard

Implement a profile page where users can view and update their details (Name, Phone, CNIC) using the '/api/user/{id}' endpoints.

- Challan History View

Create a detailed list view (Table/Grid) of all past challans with filtering capabilities (Paid, Unpaid, Date).

- Admin Panel

Develop a separate, protected dashboard for admins to add cameras, review appeals, and view system health statistics.

- Live Camera Feed Component

Implement a video player component to display RTSP streams (or mock streams) for selected cameras.

2. Backend Development (FastAPI/Python)

- Real Payment Gateway

Replace the current mock payment implementation with a real gateway integration like Stripe or JazzCash.

- Notification System

Integrate SMTP (Email) or Twilio (SMS) to send real alerts for challan issuance and payment confirmation.

- Advanced AI Model

Improve 'predictors.py' to use a more robust ANPR (Automatic Number Plate Recognition) model like EasyOCR or a custom-trained YOLO model.

- Dockerization

Create a 'Dockerfile' and 'docker-compose.yml' to containerize the application for easy deployment.

- Security Enhancements

Implement proper JWT (JSON Web Token) authentication and add rate limiting to API endpoints to prevent abuse.

- Unit Testing

Write comprehensive unit tests using 'pytest' for all API endpoints to ensure reliability.

3. Android App Development (Kotlin)

- Map Integration

Implement Google Maps or Leaflet (via WebView) to display camera locations on the mobile app.

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- Challan List & Detail View

Create a RecyclerView to display the user's challan history fetched from the backend API.

- Push Notifications

Fully implement Firebase Cloud Messaging (FCM) to handle and display push notifications for new challans.

- Profile Management

Build native screens for viewing and updating user profile information.

- Authentication Flow

Complete the Login and Registration screens with proper API integration and token management.