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# 📑 Software Requirements Specification (SRS)

Project: Smart Tourist Safety Monitoring & Incident Response System (MVP)

Prepared For: Ministry of Development of North Eastern Region / Ministry of Tourism / Ministry of Home Affairs

Category: Software (Travel & Tourism Safety)

Version: 1.0 (MVP)

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## 1. Introduction

### 1.1 Purpose

The purpose of this system is to provide a secure, real-time safety monitoring solution for tourists using Blockchain (Digital ID), AI (Anomaly Detection), and Geo-fencing. The MVP focuses on core features: Digital ID, Mobile App with panic button & geo-fencing, AI-based anomaly alerts, and Police/Tourism Dashboard.

### 1.2 Scope

- Tourists: Secure digital ID, location-based safety monitoring, panic button.
- Authorities (Tourism & Police): Dashboard for real-time alerts, location tracking, and incident management.
- Families: Optional location-sharing.

This will increase tourist safety, faster response times, and data-driven monitoring in high-risk regions (e.g., Northeast India).

### 1.3 Definitions, Acronyms, Abbreviations

- Digital ID: Blockchain-based temporary ID for tourists.

- Geo-fencing: Location-based boundary alerts.
- AI Anomaly Detection: Automated detection of unusual tourist behaviour.
- E-FIR: Electronic First Information Report.

### 1.4 References

- Ministry of Tourism Guidelines.
- IEEE SRS Standard (IEEE 830).

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# 2. Overall Description

## 2.1 Product Perspective

The system consists of:

- Tourist Mobile App (Android/iOS – React Native).
- Backend (Express.js/Django REST API with PostgreSQL + Blockchain).
- Police/Tourism Dashboard (React.js web app).
- AI Rule-based anomaly detection engine.

## 2.2 Product Functions (MVP)

1. Generate and store Digital Tourist ID on Blockchain.
2. Tourist login via Mobile App.
3. Geo-fencing alerts when entering restricted/high-risk zones.
4. Panic button for SOS alerts.
5. AI anomaly detection: inactivity, sudden drop-off, route deviation.

6. Police/Tourism Dashboard: real-time alerts, maps, incident logs.

### 2.3 User Characteristics

- Tourists: Basic smartphone users, multilingual needs.
- Police/Tourism Officers: Basic IT skills, dashboard operators.
- System Admins: Technical staff for backend maintenance.

### 2.4 Constraints

- MVP will not include IoT wearables, multilingual support, or advanced ML models.
- Internet connectivity required for real-time monitoring.
- Limited blockchain integration (testnet for MVP).

### 2.5 Assumptions & Dependencies

- Tourists have smartphones with GPS enabled.
- Police/Tourism departments have internet access.
- Blockchain infrastructure is hosted on a government or NIC-supported server.

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## 3. Specific Requirements

### 3.1 Functional Requirements

#### A. Tourist Mobile App

- FR-1: Register/Login with Blockchain-based Digital ID.
- FR-2: Display safety score (basic rule-based).
- FR-3: Trigger geo-fencing alerts.

- FR-4: Panic button sends live location & ID to dashboard.
- FR-5: Share real-time location with family (opt-in).

**B. AI Anomaly Detection**

- FR-6: Detect inactivity > X hours.
- FR-7: Detect sudden location drop/loss of signal.
- FR-8: Detect deviation from planned route.
- FR-9: Send anomaly alerts to dashboard.

**C. Police/Tourism Dashboard**

- FR-10: View tourists on live map.
- FR-11: Receive panic button alerts.
- FR-12: View Digital ID & itinerary details.
- FR-13: View anomaly alerts.
- FR-14: Maintain incident log.

**D. Blockchain Digital ID System**

- FR-15: Generate Digital ID linked to KYC & itinerary.
- FR-16: Store ID on Blockchain (tamper-proof).
- FR-17: Expire ID automatically at end of trip.

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## 3.2 Non-Functional Requirements

- NFR-1 (Performance): Alerts should reach dashboard within 5 seconds of panic/anomaly.

- NFR-2 (Scalability): System should support 10,000+ active tourists simultaneously.
- NFR-3 (Security): End-to-end encryption (AES-256), OAuth2.0 authentication, tamper-proof Blockchain.
- NFR-4 (Availability): 99.5% uptime.
- NFR-5 (Usability): Tourist app should support English for MVP (multilingual later).
- NFR-6 (Maintainability): Modular microservices-based backend.

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# 4. System Models

## 4.1 Use Case Diagram (MVP)

Actors: Tourist, Police Officer, System Admin

Use Cases: Register, Login, Panic Alert, Geo-fence Alert, Anomaly Detection, View Dashboard, Log Incident.

## 4.2 Data Flow (High-Level)

1. Tourist registers → Blockchain Digital ID created.
2. Tourist app sends location → Geo-fencing checks.
3. Panic button / anomaly triggers alert.
4. Backend forwards alert → Police Dashboard.
5. Dashboard logs incident.

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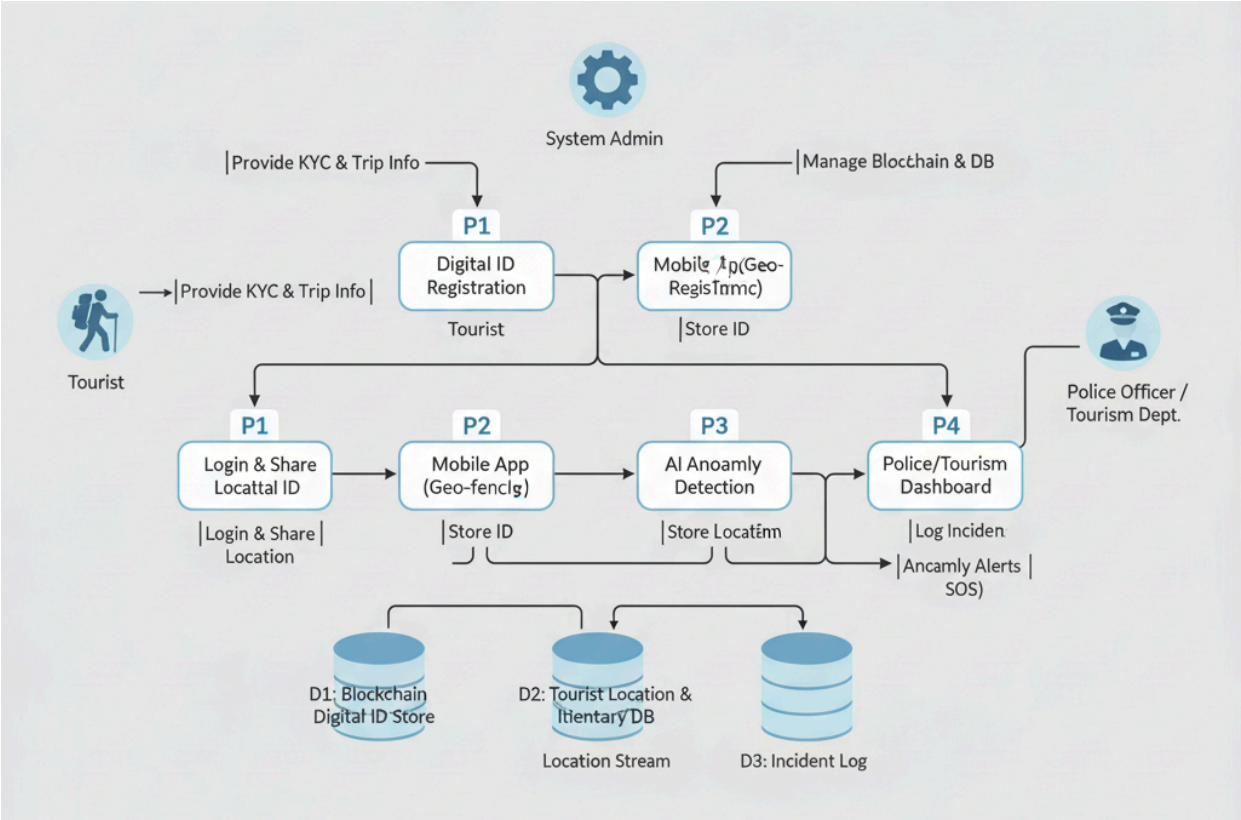
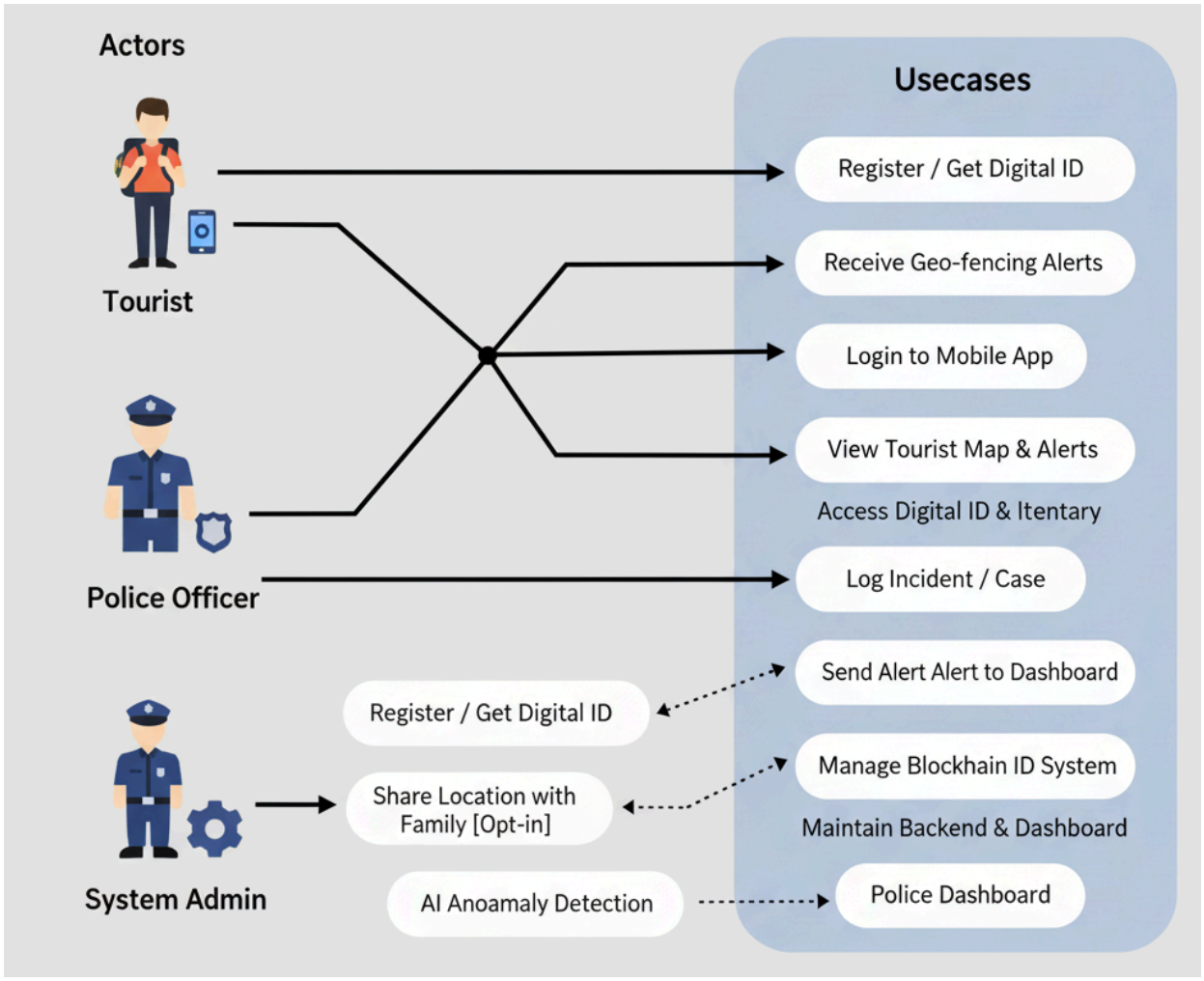
# 5. MVP Deliverables

- Tourist Mobile App (React Native).

- Backend APIs + Blockchain ID module.
- Police/Tourism Dashboard (React.js).
- Rule-based AI anomaly detection service.


System Admin
Provide KYC & Trip Info
Manage Blockchain & DB
P1
Digital ID Registration
P2
Tourist
Store ID
Tourist
Police Officer / Tourism Dept.
P1
Login & Share Location
P2
Mobile App (Geo-fencing)
P3
AI Anomaly Detection
P4
Police/Tourism Dashboard
Login & Share Location
Store ID
Log Incident
Anomaly Alerts SOS)
D1: Blockchain Digital ID Store
D2: Tourist Location & Itinerary DB
Location Stream
D3: Incident Log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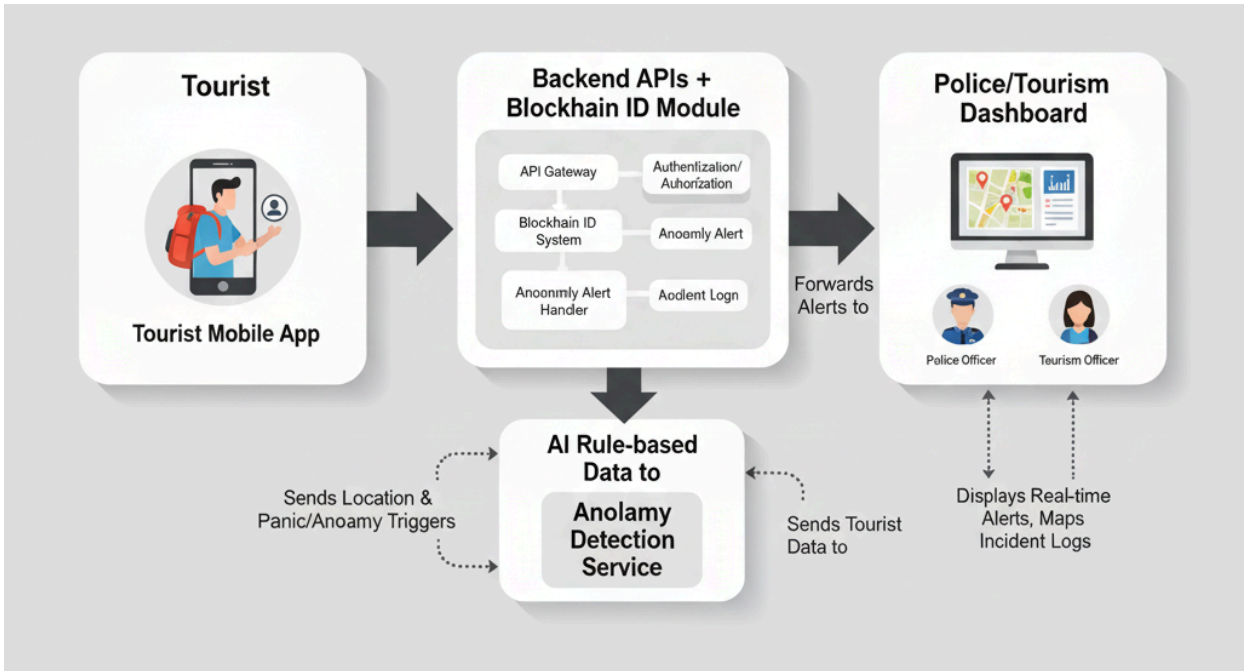
Tourist
Police Officer
System Admin
Register / Get Digital ID
Receive Geo-fencing Alerts
Login to Mobile App
View Tourist Map & Alerts
Access Digital ID & Itentary
Log Incident / Case
Send Alert Alert to Dashboard
Manage Blockhain ID System
Maintain Backend & Dashboard
Police Dashboard
Register / Get Digital ID
Share Location with Family [Opt-in]
AI Anoamaly Detection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Forwards Alerts to
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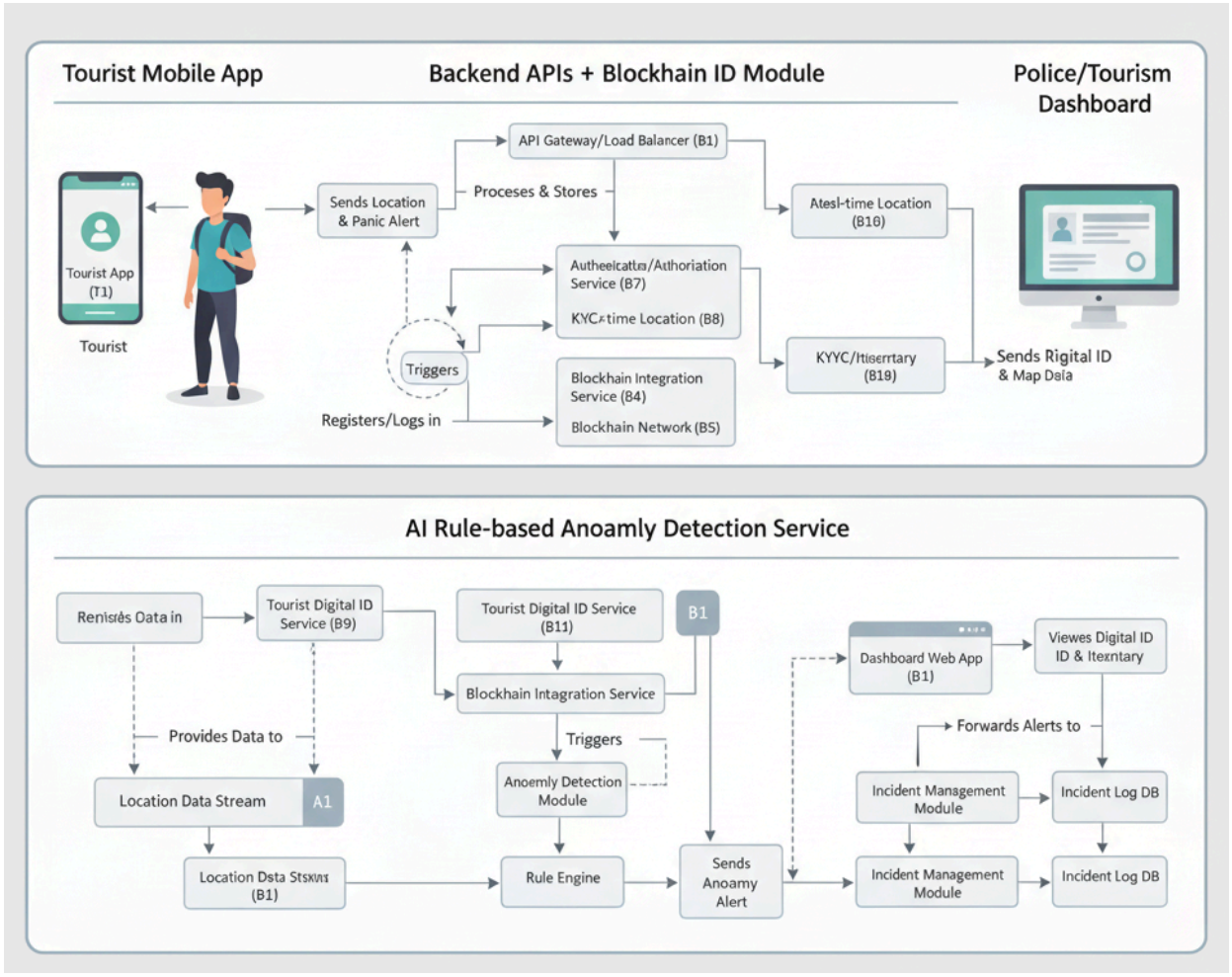
Sends Location & Panic/Anoamy Triggers
Sends Tourist Data to
Displays Real-time Alerts, Maps Incident Logs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Police/Tourism Dashboard
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API Gateway/Load Balancer (B1)
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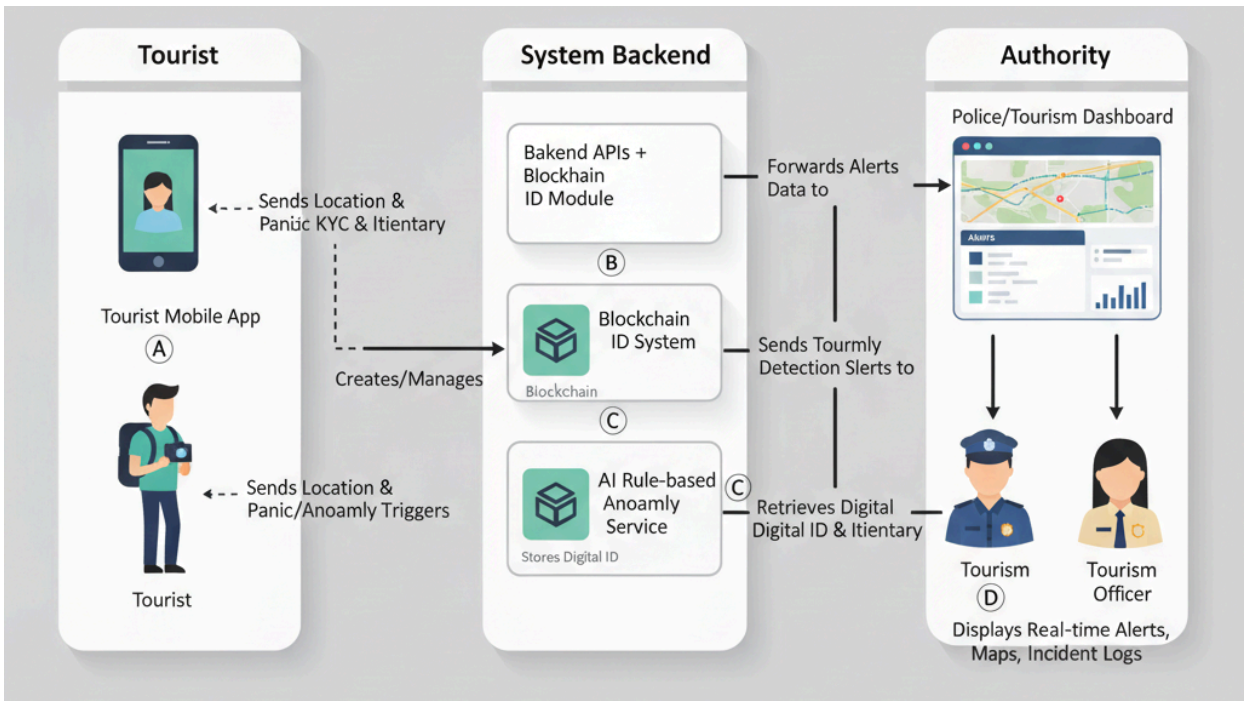
Atesl-time Location (B16)
Triggers
Registers/Logs in
Blockhain Integration Service (B4)
Blockhain Network (B5)
KYYC/Itiserrtary (B19)
Sends Rigital ID & Map Daía
AI Rule-based Anoamly Detection Service
Tourist Digital ID Service (B9)
Tourist Digital ID Service (B11)
B1
Blockhain Intagration Service
Provides Data to
Triggers
Location Data Stream
A1
Anoemly Detection Module
Location Dsta Stsкиs (B1)
Rule Engine
Sends Anoamy Alert
Dashboard Web App (B1)
Viewes Digital ID ID & Itexntary
Forwards Alerts to
Incident Management Module
Incident Log DB
Incident Management Module
Incident Log DB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B
Blockchain ID System
Blockchain
Sends Tourmly Detection Slerts to
Creates/Manages
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AI Rule-based Anoamly Service
Stores Digital ID
Retrieves Digital Digital ID & Itientary
Sends Location & Panic/Anoamly Triggers
Tourist
Tourism
Tourism Officer
D
Displays Real-time Alerts, Maps, Incident Logs