CORRECTED USER HIERARCHY & REGISTRATION FLOW

Multi-Tier Object Detection Counter System

CORRECTED USER ROLES

Super Admin (System Owner/Manager)

Full Control - Manages Everything:

- ✅ Create and manage organizations
- ✅ Register and manage ALL sites
- ✅ Register and configure ALL cameras
- ✅ Manage all users (Sub-Admins and Viewers)
- ✅ Configure detection zones
- ✅ Set up alert rules
- ✅ Access all data across all sites
- ✅ Generate reports
- ✅ System configuration
- ✅ Billing management

Sub-Admin (Site Viewer with Limited Actions)

Read-Only + Basic Site Actions:

- ✅ View assigned sites' data
- ✅ View real-time counts
- ✅ View historical analytics
- ✅ Generate reports for assigned sites
- ✅ Receive alerts/notifications
- ✅ Download reports
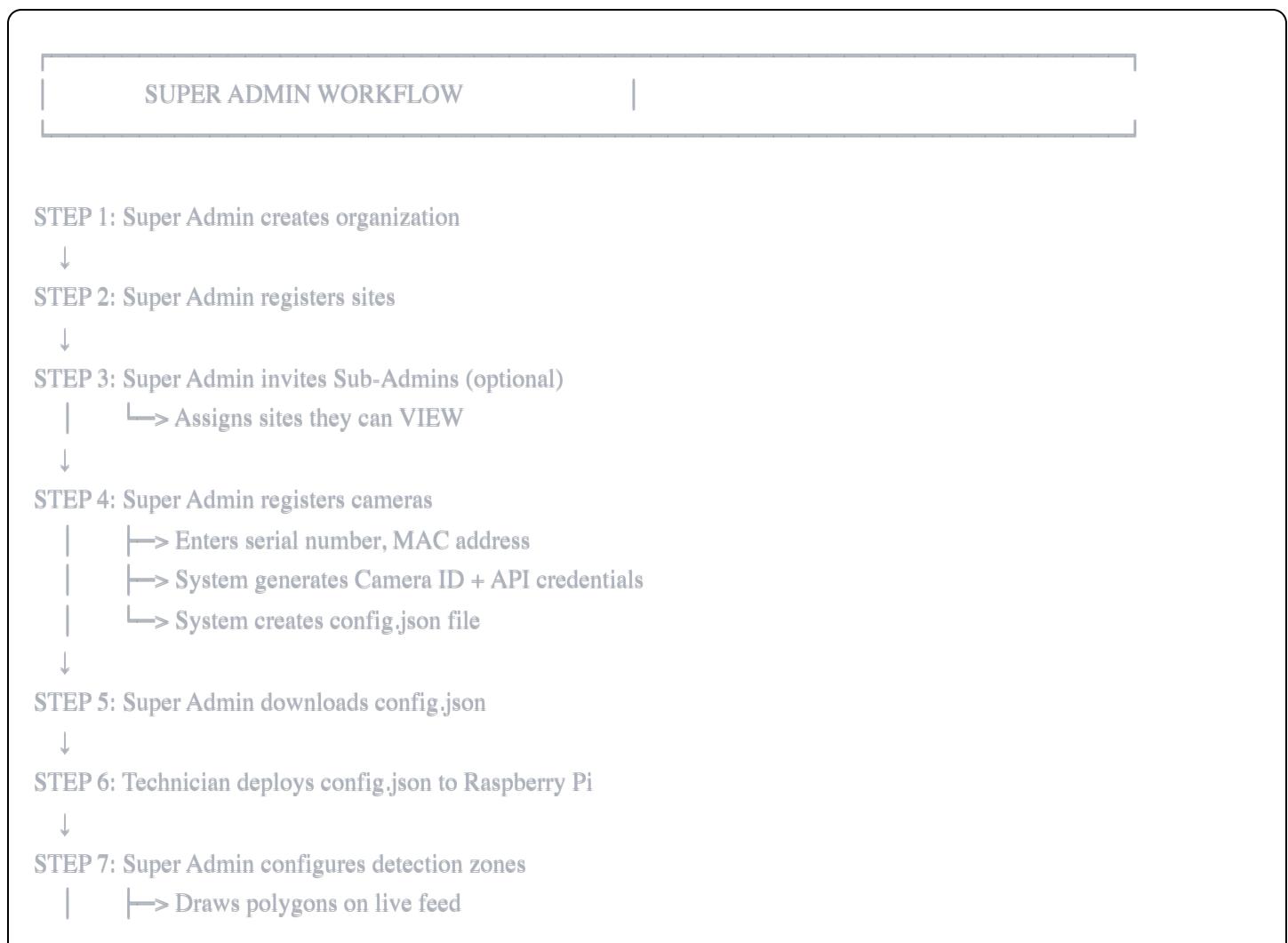- ❌ Cannot register cameras

- ❌ Cannot configure detection zones
- ❌ Cannot manage users
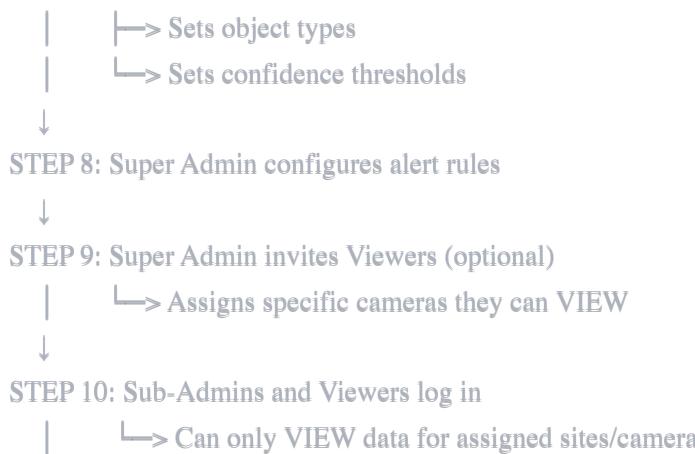- ❌ Cannot modify system settings

Viewer (Read-Only Observer)

Pure Read-Only:

- ✅ View real-time counts (assigned cameras only)
- ✅ View historical data
- ✅ Generate basic reports
- ❌ Cannot modify anything
- ❌ Cannot configure anything

CORRECTED REGISTRATION FLOW

```
┌────────────────────────────────────────────────────┐
│           SUPER ADMIN WORKFLOW          │          │
└────────────────────────────────────────────────────┘


STEP 1: Super Admin creates organization

    ↓
STEP 2: Super Admin registers sites

    ↓
STEP 3: Super Admin invites Sub-Admins (optional)
    │         └──> Assigns sites they can VIEW

    ↓
STEP 4: Super Admin registers cameras
    │         ├──> Enters serial number, MAC address
    │         ├──> System generates Camera ID + API credentials
    │         └──> System creates config.json file

    ↓
STEP 5: Super Admin downloads config.json

    ↓
STEP 6: Technician deploys config.json to Raspberry Pi

    ↓
STEP 7: Super Admin configures detection zones
    │         ├──> Draws polygons on live feed
```

```
    |        ├──> Sets object types
    |        └──> Sets confidence thresholds
    |
    ↓
STEP 8: Super Admin configures alert rules

    ↓
STEP 9: Super Admin invites Viewers (optional)
    |        └──> Assigns specific cameras they can VIEW
    |
    ↓
STEP 10: Sub-Admins and Viewers log in
    |        └──> Can only VIEW data for assigned sites/cameras
```

┌───┐
| │   SUB-ADMIN & VIEWER WORKFLOW   │ |
└───┘

1. Receive invitation email from Super Admin

2. Accept invitation and set password

3. Log in to dashboard

4. View assigned sites/cameras only

5. Monitor real-time counts

6. Generate and download reports

7. Receive alerts (if configured by Super Admin)

❌ Cannot register cameras
❌ Cannot configure anything
❌ Cannot modify settings

DETAILED STEP-BY-STEP (CORRECTED)

Phase 1: Super Admin Initial Setup

1. Super Admin Account Creation
    └──> First user becomes Super Admin
    └──> Enable 2FA

2. Create Organization
    └──> Organization name, industry, billing plan

3. Register Sites
    └──> Site name, address, timezone

    └─> Upload floor plan (optional)
    └─> Set operating hours

Phase 2: Camera Registration (SUPER ADMIN ONLY)

SUPER ADMIN ACTIONS:

Step 1: Navigate to "Cameras" → "Register New Camera"

Step 2: Fill in Camera Details
    ├─> Serial Number: [from RPi label]
    ├─> MAC Address: [from RPi]
    ├─> Camera Name: "Entrance A - North"
    ├─> Location: "Main entrance, north side"
    ├─> Assign to Site: [Select from dropdown]
    └─> Camera Model: "Raspberry Pi 4B + Camera V2"

Step 3: System Generates Credentials
    ├─> Camera ID: CAM_X9K2L7 (auto-generated)
    ├─> API Key: [encrypted credentials]
    └─> Config file: CAM_X9K2L7-config.json (created)

Step 4: Download Configuration
    └─> Click "Download Config"
    └─> Save CAM_X9K2L7-config.json

Step 5: Deploy to Raspberry Pi
    ├─> Transfer config to RPi (SCP, USB, or in-person)
    └─> Run: ./deploy-config.sh CAM_X9K2L7-config.json

Step 6: Verify Camera Online
    └─> Dashboard shows "Online" status
    └─> View live feed

Step 7: Configure Detection Zones
    ├─> Select camera from list
    ├─> Click "Configure Detection Zones"
    ├─> Draw polygons on live feed
    ├─> Select object types (person, vehicle, forklift)
    ├─> Set confidence threshold (0.75-0.85)
    └─> Save configuration

Step 8: Configure Alerts

```
         ├─> Create alert rule
         ├─> Set threshold (e.g., count > 50)
         ├─> Configure notification channels (email/SMS)
         ├─> Assign recipients (can include Sub-Admins)
         └─> Activate alert


Step 9: Test Everything
         ├─> Run 5-minute detection test
         ├─> Verify counts are accurate
         ├─> Test alert notification
         └─> Mark camera as "Active"
```

Phase 3: User Management (SUPER ADMIN ONLY)

```
INVITE SUB-ADMINS (Optional):


Step 1: Navigate to "Users" → "Invite Sub-Admin"


Step 2: Enter Details
         ├─> Email address
         ├─> Name
         ├─> Assign sites (what they can VIEW)
         └─> Set permissions:
              ├─> View real-time data
              ├─> View historical data
              ├─> Generate reports
              ├─> Receive alerts
              └─> Download data


Step 3: Send Invitation
         └─> Sub-Admin receives email


Step 4: Sub-Admin Accepts
         ├─> Clicks activation link
         ├─> Sets password
         ├─> Enables 2FA
         └─> Logs in to view-only dashboard


---


INVITE VIEWERS (Optional):


Step 1: Navigate to "Users" → "Invite Viewer"
```

```
Step 2: Enter Details
    ├──> Email address
    ├──> Name
    ├──> Assign specific cameras (what they can VIEW)
    └──> Set data access period (last 7/30/90 days)

Step 3: Send Invitation
    └──> Viewer receives email

Step 4: Viewer Accepts
    ├──> Clicks activation link
    ├──> Sets password
    └──> Logs in to read-only dashboard
```

CORRECTED FIRESTORE DATA MODEL

```javascript
```

```
organizations/{orgId}
├── name: "Acme Manufacturing"
├── ownerId: "super_admin_user_id"  // Super Admin
├── createdAt: timestamp
│
├── sites (subcollection)
│   ├── {siteId}
│   │   ├── name: "Warehouse North"
│   │   ├── address: "123 Industrial Way"
│   │   ├── timezone: "America/Los_Angeles"
│   │   ├── managedBy: "super_admin_user_id"  // NOT sub-admin
│   │   │
│   │   ├── cameras (subcollection)
│   │   │   ├── {cameraId}
│   │   │   │   ├── name: "Entrance A"
│   │   │   │   ├── serialNumber: "SN123456"
│   │   │   │   ├── status: "online"
│   │   │   │   ├── registeredBy: "super_admin_user_id"
│   │   │   │   ├── detectionZones: [...]
│   │   │   │   │
│   │   │   │   ├── counts (subcollection)
│   │   │   │   │   ├── {timestamp}
│   │   │   │   │   │   ├── counts: {...}
│
├── users (collection)
│   ├── {userId}
│   │   ├── email: "subadmin@company.com"
│   │   ├── role: "sub_admin"
│   │   ├── assignedSites: ["site1", "site2"]  // VIEW access only
│   │   ├── permissions: {
│   │   │       view: true,
│   │   │       edit: false,
│   │   │       delete: false,
│   │   │       register: false
│   │   │   }
```

CORRECTED SECURITY RULES

```javascript
```

```
rules_version = '2';
service cloud.firestore {
  match /databases/{database}/documents {

    function isSuperAdmin() {
      return request.auth != null &&
          request.auth.token.role == 'super_admin';
    }

    function isSubAdmin() {
      return request.auth != null &&
          request.auth.token.role == 'sub_admin';
    }

    function canViewSite(siteId) {
      return isSuperAdmin() ||
          (isSubAdmin() &&
           request.auth.token.assignedSites.hasAny([siteId]));
    }

    // Organizations
    match /organizations/{orgId} {
      // Only Super Admin can write
      allow read: if request.auth != null;
      allow write: if isSuperAdmin();

      // Sites
      match /sites/{siteId} {
        // Super Admin: full access
        // Sub-Admin: read-only for assigned sites
        allow read: if canViewSite(siteId);
        allow write: if isSuperAdmin();  // ONLY Super Admin

        // Cameras
        match /cameras/{cameraId} {
          // Super Admin: full access
          // Sub-Admin: read-only for assigned sites
          // Viewer: read-only for assigned cameras
          allow read: if canViewSite(siteId);
          allow write: if isSuperAdmin();  // ONLY Super Admin

          // Counts
          match /counts/{countId} {
```

```
      allow read: if canViewSite(siteId);
      allow create: if request.auth != null;  // Cameras write
      allow update, delete: if isSuperAdmin();
    }
   }
  }
 }


 // Users (Super Admin only)
 match /users/{userId} {
  allow read: if request.auth.uid == userId;
  allow write: if isSuperAdmin();
 }
}
}
```

DASHBOARD INTERFACE DIFFERENCES

Super Admin Dashboard

```
Navigation Menu:
 ├── Dashboard (overview of all sites)
 ├── Organizations
 │   └── Manage billing, settings
 ├── Sites
 │   ├── Add New Site
 │   ├── Edit Sites
 │   └── Delete Sites
 ├── Cameras
 │   ├── Register New Camera  ⭐ ONLY SUPER ADMIN
 │   ├── Configure Detection Zones  ⭐ ONLY SUPER ADMIN
 │   ├── Edit Camera Settings
 │   └── Remove Cameras
 ├── Alerts
 │   ├── Create Alert Rules  ⭐ ONLY SUPER ADMIN
 │   ├── Configure Notifications
 │   └── View Alert History
 ├── Users
 │   ├── Invite Sub-Admins  ⭐ ONLY SUPER ADMIN
 │   ├── Invite Viewers
 │   ├── Manage Permissions
```

```
|       └──── Revoke Access
├──── Analytics
|   ├──── Real-time Monitoring
|   ├──── Historical Reports
|   └──── Export Data
└──── Settings
    ├──── System Configuration
    ├──── API Keys
    └──── Billing
```

Sub-Admin Dashboard (Read-Only + Reports)

```
Navigation Menu:
├──── Dashboard (assigned sites only)
|   └──── Real-time counts
├──── Sites (VIEW ONLY)
|   └──── View assigned sites
├──── Cameras (VIEW ONLY)
|   ├──── View camera list
|   ├──── View live feeds
|   └──── View detection zones (cannot edit)
├──── Analytics
|   ├──── Real-time Monitoring
|   ├──── Historical Reports
|   └──── Export Reports  ⭐ CAN DOWNLOAD
├──── Alerts (VIEW ONLY)
|   └──── View alerts received
└──── Profile
    └──── Change password, 2FA settings

❌ Cannot access:
   - Camera registration
   - Detection zone configuration
   - User management
   - System settings
   - Billing
```

Viewer Dashboard (Pure Read-Only)

```
Navigation Menu:
├──── Dashboard (assigned cameras only)
|   └──── Real-time counts
```

```
├──── Cameras (VIEW ONLY)
│    └──── View assigned cameras only
├──── Reports
│    ├──── View reports
│    └──── Export data
└──── Profile
     └──── Change password


❌ Cannot access anything else
```

ONBOARDING TIMELINE (CORRECTED)

Day	Activity	Responsible	Action
1	Firebase setup	Super Admin	Setup backend
1-2	Create org & sites	Super Admin	Register sites
2-3	Invite Sub-Admins	Super Admin	Send invitations
3-5	Camera registration	Super Admin	Register all cameras
3-5	Physical installation	Technician	Mount & connect cameras
5-6	Config deployment	Technician	Deploy config files
6-7	Zone configuration	Super Admin	Configure detection zones
7	Alert setup	Super Admin	Configure alerts
7	Invite Viewers	Super Admin	Send invitations (optional)
7+	Monitoring	Sub-Admins & Viewers	View data only

KEY DIFFERENCES FROM PREVIOUS VERSION

❌ WRONG (Previous):

- Sub-Admin registers cameras

- Sub-Admin configures detection zones

- Sub-Admin manages site settings

✅ CORRECT (This Version):

- **ONLY Super Admin** registers cameras

- **ONLY Super Admin** configures detection zones

- **ONLY Super Admin** manages everything

- Sub-Admin = **Viewer with reports** (not manager)

- Sub-Admin can only VIEW and REPORT

REGISTRATION SCRIPT LOCATION

Who Runs What:

Super Admin:

- Registers camera in web dashboard

- Downloads config.json

- Provides config to technician

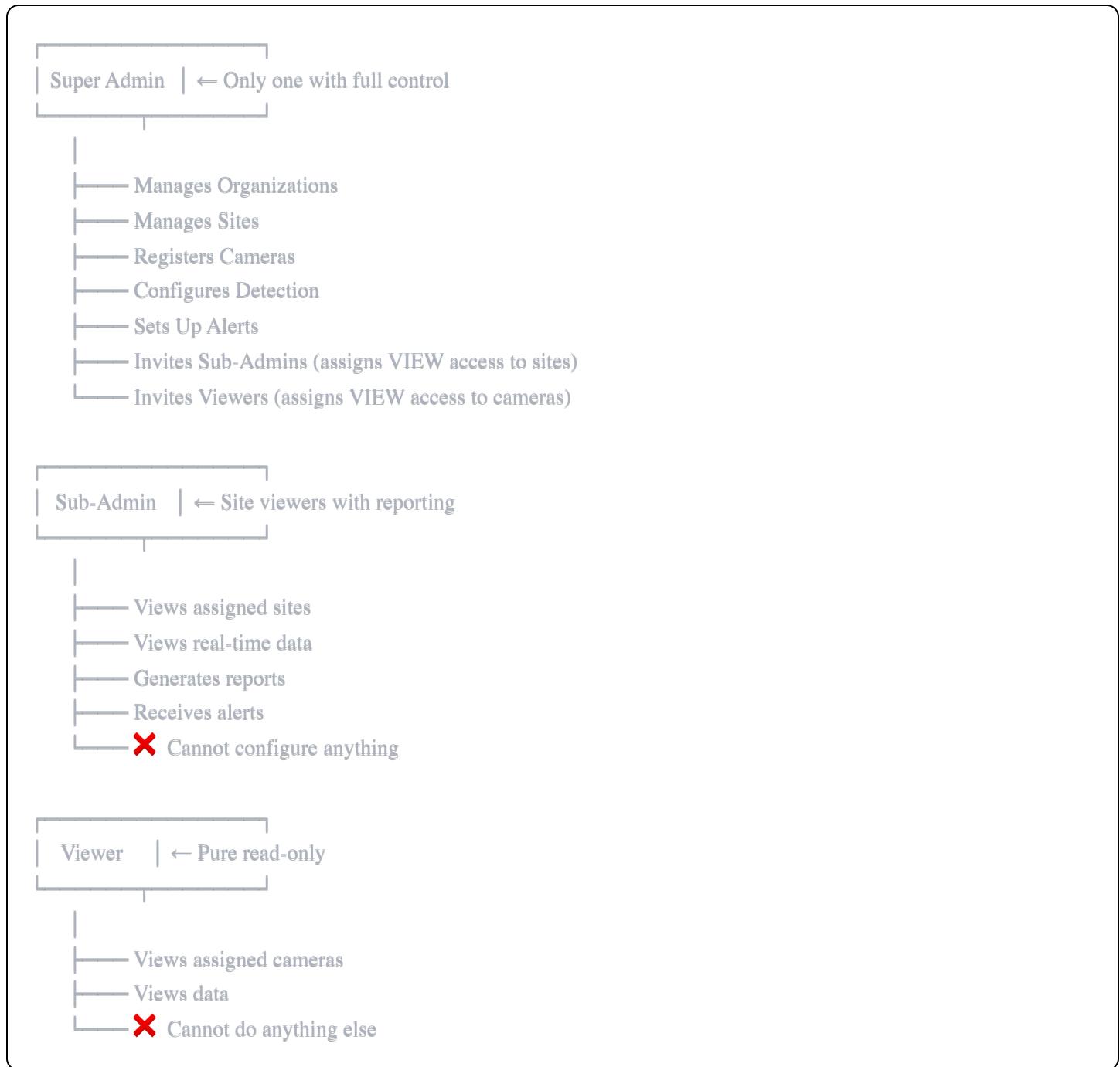**Technician (on-site):**

- Physically installs camera

- Deploys config.json to RPi

- Verifies camera online

- Reports back to Super Admin

Sub-Admin:

- Logs in to dashboard

- Views data for assigned sites

- Generates reports

- Monitors alerts

WORKFLOW DIAGRAM

```
┌─────────────┐
│ Super Admin │  ← Only one with full control
└─────────────┘
      │
      ├─────── Manages Organizations
      ├─────── Manages Sites
      ├─────── Registers Cameras
      ├─────── Configures Detection
      ├─────── Sets Up Alerts
      ├─────── Invites Sub-Admins (assigns VIEW access to sites)
      └─────── Invites Viewers (assigns VIEW access to cameras)


┌─────────────┐
│ Sub-Admin   │  ← Site viewers with reporting
└─────────────┘
      │
      ├─────── Views assigned sites
      ├─────── Views real-time data
      ├─────── Generates reports
      ├─────── Receives alerts
      └───❌ Cannot configure anything


┌─────────────┐
│ Viewer      │  ← Pure read-only
└─────────────┘
      │
      ├─────── Views assigned cameras
      ├─────── Views data
      └───❌ Cannot do anything else
```

CORRECTED PROMPTS FOR VIBE CODING TOOLS

Prompt: Admin Dashboard (CORRECTED ROLES)

Create a React admin dashboard with THREE distinct user interfaces:

1. SUPER ADMIN INTERFACE (Full Control):
   - Can register cameras
   - Can configure detection zones
   - Can manage all users
   - Can access all sites and cameras
   - Full CRUD operations everywhere

2. SUB-ADMIN INTERFACE (Viewer + Reports):
   - READ-ONLY access to assigned sites
   - Can view real-time data
   - Can generate and download reports
   - Can receive alerts
   - CANNOT register cameras
   - CANNOT configure anything
   - CANNOT manage users

3. VIEWER INTERFACE (Pure Read-Only):
   - READ-ONLY access to assigned cameras
   - Can view real-time counts
   - Can export basic reports
   - CANNOT configure anything

Security:
- Role-based routing with strict checks
- Custom claims in Firebase JWT: {role: 'super_admin' | 'sub_admin' | 'viewer', assignedSites: [...]}
- Hide/disable UI elements based on role
- API calls must verify permissions server-side

Navigation should adapt based on user role.

SUMMARY

Who Does What:

- **Super Admin** = Does EVERYTHING (registers, configures, manages)

- **Sub-Admin** = VIEWS data + generates reports (assigned sites only)

- **Viewer** = VIEWS data only (assigned cameras only)

Camera Registration:

- ONLY Super Admin can register cameras

- Sub-Admin just views the results

- This ensures quality control and proper management

Installation Flow:

1. Super Admin registers camera → gets config

2. Technician deploys config → camera goes online

3. Super Admin configures zones → camera starts counting

4. Sub-Admin views results → monitoring only

This is the correct hierarchy for a commercial system where central management (Super Admin) maintains control and site personnel (Sub-Admin) monitor operations.