

# Estate Management System — Full Product Requirements Document (PRD)

The Estate Management System is an open-source, mobile-web application that helps property owners manage multiple properties in one place. It streamlines payment collection, tenant records, maintenance requests, and communication between landlords and tenants.

By providing a centralized, transparent, and accessible platform, the system reduces administrative burden, improves tenant–landlord relations, and offers a flexible solution that can scale from individual landlords to larger property firms.

## Goals

- Provide landlords a single dashboard for multiple estates (residential & commercial).
- Provide tenants a convenient digital interface for payments, receipts, and estate services.
- Improve trust, transparency, and security with mandatory verification for both landlords and tenants.
- Reduce communication friction via broadcast announcements and one-way notifications.

## User Roles

Role	Capabilities
<b>Landlord/Admin</b>	Create & verify properties, upload ownership proof, invite tenants via unit links, approve tenants, approve/reject payments, issue receipts, initiate safe move-outs, send broadcast announcements, oversee maintenance.
<b>Tenant/User</b>	Verify ID, join via invite link, upload receipts, receive official receipts, raise maintenance requests, generate visitor passes, receive notifications & announcements.

## Core Features

### 1. User Onboarding & Verification

## Landlords


- **Sign In:** Email and Phone num OTP
- **Create Property:** Enter name, address, type (residential/commercial), and units/shops.
- **Dashboard Access:** Landlord immediately gets a property dashboard and can generate tenant invite links.
- **Optional Verification:**  
Upload **signature & stamp** → to enable official PDF receipts.  
Upload **ownership proof (Title/C of O/utility bill)** → only if disputes, move-outs, or compliance actions require it.
- **Status:** Landlords are active by default. Verification is optional and triggered **only when needed**, not during onboarding.

## Tenants

- Join via **unit-specific invite link**.
- Fill **verification form**:
  - Government-issued ID (NIN, Passport, Driver's License, Voter's Card).
  - Passport photograph.
  - Emergency contact (name, relationship, phone).
  - Optional: occupation/employment details.
- Status = **Pending Verification** until landlord approves.

## 2. Admin (Landlord) Features

1. **Multi-Property Dashboard**
  - View all properties with occupancy, pending payments, and open maintenance requests.
2. **Tenant & Unit Management**
  - Approve/reject tenant requests (after verification).
  - Assign tenants to units.
  - Mark units as vacant when free.
3. **Payment & Receipt Management**
  - Tenants upload receipts → admin reviews.
  - Approve → system generates official **PDF receipt** with:
    - Property & tenant details.
    - Unique receipt number (RCP-**{PropertyCode}**-**{YYYY}**-**{Serial}**).
    - Landlord's **signature & stamp**.
    - QR code for verification.
  - Reject → tenant notified with reason.
  - Export monthly receipts.
4. **Maintenance Request Oversight**
  - View all requests.
  - Filter by urgency (Urgent/Normal).

- Assign & mark as resolved.
- 5. **Safe Move-Out Flow:**
  - Landlord initiates move-out → provides reason + proposed date.
  - Tenant notified → can **Confirm** or **Dispute**.
  - If Confirmed → tenant removed on date, unit becomes vacant.
  - If Disputed → removal paused until resolved.
  - If No Response → auto-remove after date passes, provided no dispute exists.
  - Historical receipts & maintenance remain intact.
- 6.  **Broadcast Announcements**
  - Landlord writes short text (max 300 chars).
  - Scope: All tenants of a property or select units.
  - Sends via WhatsApp (with “Open App” button) + appears in tenant’s in-app announcements list.
  - One-way only, no replies.
- 7. **Profile Management**
  - Upload/change signature & stamp.
  - Update signer details (name, title).

### 3. Tenant (User) Features

1. **Payments & Receipts**
  - Upload proof of payment.
  - Track approval status.
  - Download official signed + stamped PDF receipt.
  - Access full history in “Payments.”
2. **Notifications**
  - One-way alerts via WhatsApp (with fallback Email/SMS):
    - Payment approved/rejected.
    - Receipt ready.
    - Upcoming/overdue dues.
    - Maintenance updates.
    - **Landlord announcements.**
3. **Maintenance Requests**
  - Submit with title, description, photo/voice (optional).
  - Set urgency (Urgent/Normal).
  - Track progress until resolved.
4. **Access Control**
  - Permanent QR: tenant’s entry pass (auto-refreshes).
  - Visitor QR: temporary (valid only on scheduled day, expires after 24h).
  - Tenants can revoke visitor passes anytime.
5. **Tenant Dashboard**
  - Next payment due.
  - Payment history.

- Active maintenance requests.
- Quick visitor pass generator.
- Announcements list.

## Database Schema (Simplified)

### Users

| id | full\_name | phone | email | created\_at |

### UserPropertyRoles

| id | user\_id | property\_id | role (landlord/tenant) | unit\_id | status |

### LandlordVerification

| id | user\_id | id\_type | id\_number | id\_document\_url | ownership\_proof\_url | stamp\_url | signature\_url | status | verified\_at |

### TenantVerification

| id | tenant\_id | property\_id | id\_type | id\_number | id\_document\_url | passport\_photo\_url | emergency\_contact\_name | emergency\_contact\_relationship | emergency\_contact\_phone | occupation | status | verified\_at |

### Properties

| id | property\_code | name | address | type | receipt\_serial\_counter | logo\_url |

### Units

| id | property\_id | unit\_name | type (flat/shop) | invite\_link | status  
(vacant/occupied/pending\_moveout) | tenant\_id |

### MoveOutRequests

| id | tenant\_id | unit\_id | property\_id | requested\_by | reason | proposed\_date | status  
(pending/confirmed/disputed/completed) | tenant\_response | created\_at | resolved\_at |

### Receipts

| id | tenant\_id | property\_id | amount | period | receipt\_no | approved\_by | approved\_at | receipt\_pdf\_url | status |

### MaintenanceRequests

| id | tenant\_id | property\_id | title | description | urgency | status | created\_at | resolved\_at |

### VisitorPasses

| id | tenant\_id | property\_id | visitor\_name | valid\_on | status | qr\_sig | created\_at | expires\_at |

### Announcements

| id | property\_id | body | created\_by | created\_at |

## AnnouncementScopes

| id | announcement\_id | unit\_id |

## Security

- OTP login (SMS/email).
- JWT-secured API endpoints.
- All ID documents encrypted at rest.
- Receipts signed & stamped, tamper-proof.
- Tenant QR auto-refresh prevents misuse.
- Visitor QR valid only for scheduled day.
- Audit logs for all sensitive actions (approvals, move-outs, announcements).

## Success Metrics

- % of landlords successfully verified.
- % of tenants approved with valid ID.
- % of payments approved within 48h.
- % of receipts generated successfully.
- Tenant adoption rate (% invited vs onboarded).
- Number of disputes resolved in move-out flow.
- Announcement delivery rate (% sent vs failed).

## Tech Stack

- **Backend:** Python (FastAPI).
- **Database:** PostgreSQL.
- **Auth:** Firebase/Twilio OTP.
- **File Storage:** AWS S3 / Cloudinary.
- **PDF Generator:** ReportLab / pdfkit.
- **Notifications:** WhatsApp Business API (Cloud API/Twilio), Email (SendGrid), SMS fallback.
- **QR Generator:** UUID + crypto signature.

## Integration Points

- WhatsApp Cloud API → notifications & announcements.
- Email/SMS → fallback alerts.
- File storage → for IDs, receipts, signatures, stamps.
- OCR/AI (future) → auto-extract receipt data, triage maintenance requests.