

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
Landlord/Admin	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.
Tenant/User	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.