Project Title:

Residential Township Management System

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Product Requirements Document

For

“SAAS Based Residential Township Management System”

Introduction

Project Overview:

This document outlines the product requirements for a **Residential Township Management System**. The system aims to streamline and digitize operations for gated communities and large residential societies. It will serve as a comprehensive platform for residents, management committees, security personnel, service providers and facility managers.

Project Goals

The primary goal is to create a smart, efficient, and user-centric township management platform that:

- **Improves Operational Efficiency:** Automates routine society operations like maintenance billing, complaint tracking, and visitor management.
- **Enhances Resident Experience:** Offers a seamless experience to residents through real-time updates, community engagement tools, and transparent communication.
- **Promotes Digital Transformation:** Reduces paperwork, promotes eco-friendly operations, and improves data accessibility and decision-making.

Target Audience

The township management system is designed for:

- **Residents**: Families, tenants, and owners living in the township.
- **Management Committee Members**: Those responsible for administration and policy implementation.
- **Security and Facility Staff**: For managing visitors, deliveries, and building safety.
- **Vendors & Service Providers**: Electricians, plumbers, housekeeping, and other third-party service providers.

By addressing the specific needs of each user group, the system aims to deliver transparency, convenience and control.

Key Features

The Residential Township Management System will incorporate the following key features

- **Resident & Unit Management:** Manage resident profiles, flat/unit assignments, lease info, and occupancy details.
- **Maintenance & Billing Module**: Auto-generate invoices, track payments, send reminders, and view ledger reports.
- **Complaint & Issue Tracking:** Residents can raise tickets for issues, track resolution status, and rate service.
- **Visitor Management:** Track guest entries/exits using OTP, QR code, or pass system.
- **Facility Booking:** Book society amenities like clubhouses, gyms, parks, or event halls with time-slot logic.
- **Community Engagement:** In-app polls, events, discussion forums, and feedback modules.
- **Security Dashboard:** Real-time security updates, CCTV integration, and incident logging.
- **Service Staff Management:** Register domestic help, their attendance, ID verification, and access control.
- **Mobile App & Web Portal:** A responsive and intuitive interface across devices for all users.

Problems

1. **Manual Operations & Paperwork:** Traditional society operations are prone to delays, errors, and lack of traceability.
2. **Ineffective Communication:** Residents often remain uninformed about society updates, maintenance schedules, and decisions.
3. **Lack of Transparency:** Financial and operational transparency is limited without a digital trail.
4. **Security Gaps:** Manual visitor and staff tracking lacks accountability and real-time insights.
5. **Fragmented Tools:** Using separate tools for billing, communication, and complaint logging creates inefficiency.

Opportunities

1. **Centralized Management:** A single platform for all township operations ensures control and coordination.
2. **Digital Transparency:** Automated logs and dashboards build trust and transparency among residents.
3. **Operational Cost Reduction:** Reduces manual labor, optimizes staff deployment, and minimizes administrative costs.
4. **Community Building:** Digital forums, events, and polls foster better engagement and belonging among residents.
5. **Real-time Security Oversight:** Enhanced safety through visitor logs, alerts, and smart integrations.
6. **Data-Driven Decision Making:** Admins can use analytics to forecast expenses, measure resident satisfaction, and optimize resource allocation.
7. **Scalability:** A modular system that can easily scale from small societies to large townships.

User Personas

Persona 1: The Resident (Owner/Tenant)

Needs:
Hassle-free payment of maintenance dues
Quick resolution of maintenance requests
Secure visitor management
Real-time community updates

Behaviours:
Uses mobile apps for daily tasks
Attends resident meetings
Reports issues via digital channels
Monitors utility usage

Pain Points:
Delayed complaint resolution
Unclear billing breakdowns
Manual visitor approval processes
Poor communication from management

Persona 2: The Facility Manager

Needs:
Centralized dashboard for operations
Vendor performance tracking
Budget control tools
Compliance monitoring

Behaviours:
Coordinates maintenance teams
Reviews SLAs with vendors
Generates financial reports
Conducts safety audits

Pain Points:
Disjointed communication channels
Paper-based work orders
Emergency response delays
Budget overruns

Persona 3: The Security Head

Needs:
Integrated access control systems
Real-time surveillance monitoring
Emergency alert mechanisms
Visitor log analytics

Behaviours:
Patrols coordination
Incident documentation
Access rights management
Drills execution

Pain Points:
Siloed security systems
Manual visitor verification
Delayed emergency notifications
Unaudited access logs

Persona 4: The Vendor (e.g., Plumber/Electrician)

Needs:
Clear work order details
Digital payment processing
Schedule visibility
Feedback system

Behaviours:
Accepts/rejects assignments via app
Substitutes service reports
Tracks payment status

Pain Points:
Last-minute job assignments
Payment delays
Unclear scope of work

User list from the User Persona

Primary Users:

1. **Resident (Owner/Tenant):**
   Needs: Transparent billing, maintenance tracking, visitor management.
   Behaviours: Mobile-first, complaint logging, amenity bookings.
2. **Facility Manager:**
   Needs: Operational oversight, vendor coordination, compliance.
   Behaviours: Report generation, budget management, SLA enforcement.
3. **Security Head:**
   Needs: Unified security systems, real-time alerts, audit trails.
   Behaviours: Access control, incident reporting, patrol management.

Secondary Users:

1. **Vendors:**
   Needs: Streamlined work orders, timely payments.
2. **Management Committee:**
   Needs: Financial reports, policy compliance, dispute resolution.

User Stories

Below are the highlights of main user stories according to the user persona listed above -

For the Resident:
As a resident**, I want to** log maintenance requests with photos so issues are documented accurately.
• **As a** resident**, I want** to pre-approve visitors via QR codes to avoid gate delays.
• **As a** resident, **I want** to view utility consumption dashboards to monitor usage.

For the Facility Manager:
• **As a** manager, **I want to** auto-assign work orders by priority to reduce resolution time.
• **As a** manager**, I want to** track vendor performance scores to renew contracts.
• **As a** manager, **I want to** generate CAPEX/OPEX reports for budget meetings.

For the Security Head:
• **As** security head**, I want** biometric integration with resident databases to prevent unauthorized access.
• **As** security head, **I want** automated panic alerts during emergencies to mobilize teams.

For the Vendor:
• **As a** vendor, **I want** digital work orders with location pins to reach sites faster.
• **As a** vendor**, I want** UPI-based instant payments upon job completion.

Use Cases

- **Resident Use Cases:**

  Maintenance Request:
  Resident logs issue → System categorizes urgency → Auto-notifies assigned vendor.

  Visitor Management:
  Resident generates timed QR pass → Security scans at gate → Access logs updated.

  Dues Payment:
  Resident views bill → Pays via integrated gateway → Receives e-receipt.

Staff Use Cases:

Emergency Response:
Resident triggers alert → System notifies security/medical teams → Live location shared.

Compliance Audit:
Manager schedules inspection → Checklist digitalized → Issues logged with deadlines.

Vendor Assignment:
System auto-assigns work → Vendor accepts → GPS-tracked ETA shared with resident.

Admin Use Cases:

Financial Oversight:
Admin reconciles dues → Flags defaults → Sends automated reminders.

Access Control:
Security updates blacklists → Syncs with all gates → Real-time alerts on entry attempts.

Reporting:
Generates occupancy/utilization reports → Exports for regulatory submissions.

System-Level Use Cases:

Power Backup Management:
Grid failure detected → Auto-switch to generators → SMS alerts to residents.

Water Level Monitoring:
Sensors detect low tank levels → Triggers refill requests → Vendor notified.

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- **Visitor Management:** Track guest entries/exits using OTP, QR code, or pass system.
- **Facility Booking:** Book society amenities like clubhouses, gyms, parks, or event halls with time-slot logic.
- **Document Repository:** Access notices, circulars, meeting minutes, agreements, and other documents.
- **Community Engagement:** In-app polls, events, discussion forums, and feedback modules.
- **Security Dashboard:** Real-time security updates, CCTV integration, and incident logging.
- **Service Staff Management:** Register domestic help, their attendance, ID verification, and access control.
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Assumptions

The following assumptions will be considered during the system development: •

Assumptions:

- The system will be accessible via both desktop browsers and mobile apps (Android/iOS).
- Residents will have internet access and smartphones.
- Security and facility staff will be trained in using their respective interfaces.
- Payment and SMS/email gateways are reliable and provide integration APIs.

Open Questions and Risks

Open Questions

1. **Resident Onboarding and Verification:**
   -What documentation is required for resident registration?
   -How will tenant/owner identities and occupancy rights be validated?
   -What process will handle temporary residents (e.g., guests, short-term leases)?

2. **Maintenance and Service Management:**
   -How will emergency maintenance requests be prioritized and dispatched?
   -What SLAs (Service Level Agreements) apply to routine vs. urgent repairs?
   -How are third-party vendors (e.g., plumbers, electricians) vetted and managed?

3. **Billing and Payment Processing:**
   -How will utility bill splitting (water, electricity, gas) be calculated for shared facilities?
   -What late-fee policies and grace periods apply to maintenance dues?
   -Which payment methods (e.g., UPI, net banking) will be supported?

4. **Security and Access Control:**
   -How will biometric/card access logs integrate with the system?
   -What protocols govern visitor entry (e.g., pre-approvals, QR codes)?
   -How are security breaches (e.g., unauthorized access) escalated?

5. **Compliance and Legal Governance:**
   -How will local municipal regulations (e.g., waste disposal, fire safety) be enforced?
   -What data privacy standards (e.g., India's PDP Bill) apply to resident information?
   -How are resident disputes (e.g., noise complaints) documented and resolved?

Risks

1. **Data Privacy Violations:**
   Unauthorized access to sensitive resident data (Aadhaar, bank details).
   Penalties for non-compliance with data protection laws (e.g., GDPR, PDP Bill).

2. **Operational Disruptions:**
   System failures causing security lapses (e.g., gate malfunctions).
   Vendor strikes or supply shortages delaying critical maintenance.

3. **Low Resident Adoption:**
   Resistance from non-tech-savvy residents leading to underutilization.
   Inconsistent data entry (e.g., manual logs) causing reporting inaccuracies.

4. **Financial Management Failures:**
   Revenue leakage due to uncollected dues or billing errors.
   Budget overruns from unexpected infrastructure repairs.

5. **Cybersecurity Threats:**
   Ransomware attacks crippling access control or payment systems.
   Phishing scams targeting resident payment portals.

Glossary

Key Terms and Definitions

- **Township:** A large residential community with shared infrastructure (e.g., roads, parks, utilities).
- **Maintenance Dues:** Recurring fees paid by residents for upkeep of common areas and services.
- **Access Control System:** Security mechanisms (biometrics, RFID cards) regulating entry to premises.
- **Work Order:** A digital task assignment for resolving maintenance requests or inspections.
- **Grievance Redressal:** Formal process for logging and resolving resident complaints.
- **SLA (Service Level Agreement):** Contract defining response times for maintenance services.
- **Vendor Management:** Oversight of third-party service providers (e.g., landscaping, security).
- **PDP Bill (Personal Data Protection Bill):** India's data privacy legislation governing resident information.
- **API Integration:** Connecting access control, payment gateways, or utility meters to the central system.
- **Resident Portal:** Web/mobile interface for residents to pay dues, log complaints, or book amenities.
- **Emergency Alert System**: Automated notifications (SMS/app) for crises (e.g., fire, security threats).
- **Compliance Audit**: Review to ensure adherence to municipal laws and safety standards.
- **CAPEX/OPEX:** Capital expenditure (e.g., infrastructure) vs. operational expenditure (e.g., repairs).
- **AMC (Annual Maintenance Contract):** Yearly agreement for routine equipment servicing.