INFO 5100 FINAL PROJECT - Group 70 - CMS
TA - Viswanath Raju Indukuri

Team - Suhas Reddy BR(002303626)
Vemana A(002475002)
Dennis Sharon CS(002304318)

Problem: Managing gated communities involves complex processes such as pest control, communication, amenity bookings, and maintenance collections. These tasks are often handled manually or through disjointed systems, leading to inefficiencies, lack of coordination, and poor resident experiences. Administrators face challenges in maintaining transparency and operational control, while residents encounter delays in services and lack of effective communication. Delivery logistics and maintenance operations are frequently hindered due to the absence of a unified platform, resulting in increased costs, inefficiencies, and dissatisfaction among stakeholders.

Objective: To develop an intelligent and scalable **Community Management System** (CMS) that integrates pest control, maintenance, delivery logistics, and resident management. The solution will focus on operational efficiency, improving resident experiences, and ensuring seamless collaboration between residents, administrators, and service providers. The platform will automate bookings, notifications, and real-time tracking while offering a user-friendly interface for all stakeholders.

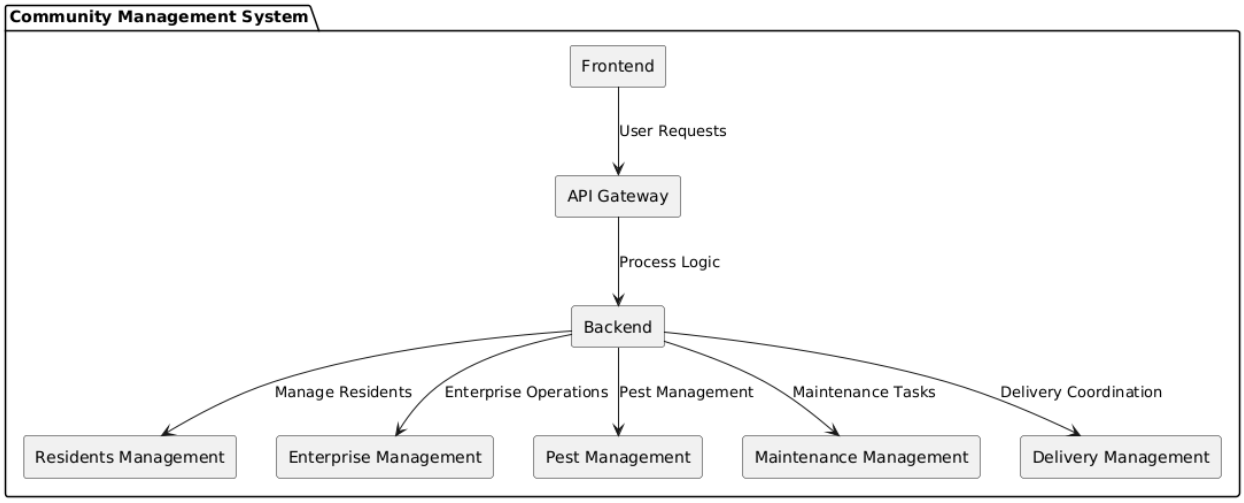
Players:

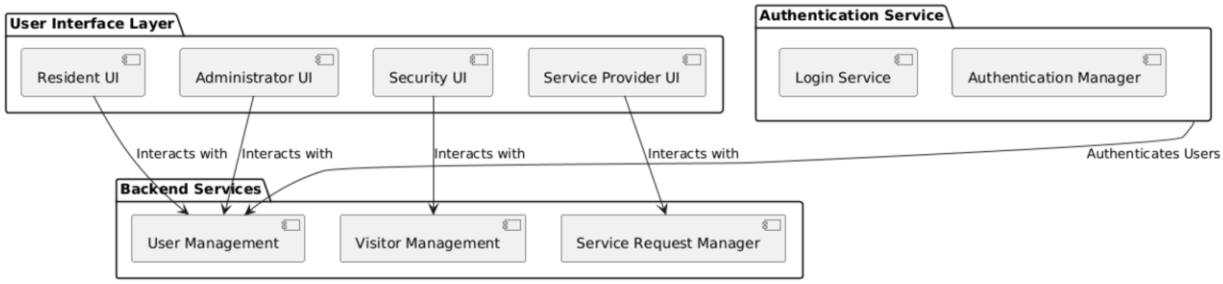
1. **Residents:** Manage household information, pay maintenance, book amenities, and receive updates through a personalized profile.
2. **Community Administrators:** Configure community-wide settings, oversee maintenance, pest management schedules, and generate comprehensive reports for transparency.
3. **Service Providers:** Register with the community to provide maintenance, pest control, or delivery services, gaining scheduled access with resident or admin approval.
4. **Delivery Personnel:** Coordinate deliveries with real-time notifications and one-time access passes for secure drop-offs.
5. **Maintenance Staff:** Maintain infrastructure, track repair schedules, and address resident complaints efficiently.

We are Addressing these key issues:

1. **Operational Efficiency:** Automates amenity bookings, maintenance fee collection, pest control schedules, and report generation. Reduces manual intervention and errors.
2. **Resident Satisfaction:** Facilitates real-time communication and notifications about events, emergencies, or updates. Ensures quick issue resolution for maintenance and pest management.
3. **Integrated Logistics:** Streamlines delivery operations and enhances coordination between service providers and residents.

Component Diagram:





1. **Frontend Application**: User interfaces for residents, administrators, and staff.
2. **Backend Infrastructure**: Core logic handling APIs and system rules.
3. **Database:** Secure data storage for profiles, schedules, and reports.
4. **API Gateway: Manages communication between frontend, backend, and external systems.**
5. **Networks:** Connects residents, administrators, and service providers.
6. **Subsystems:**

- **Pest Management**: Handles pest control requests and schedules**.**
- **Maintenance Management:** Tracks infrastructure repairs and service updates**.**
- **Delivery Management**: Manages deliveries and access coordination.
- **Resident Management**: Stores profiles and service requests.

2. Ecosystem Hierarchy and Use Cases

2.1 Ecosystem Details

Networks:

- **Community Network**: Connects all community stakeholders, including residents, administrators, and security services.
- **Logistics Network: Handles deliveries and movement tracking.**

Enterprises:

- **Resident Management Enterprise**: Handles all resident-related processes and ensures smooth communication within the community.
- **Security Services Enterprise**: Provides the necessary security infrastructure, monitoring, and incident management.
- **Service Provider Enterprise**: Manages the service providers and vendors offering various amenities or maintenance services.
- **Payment Processing Enterprise**: Manages the financial transactions related to the community, including payments for services, visitor bookings, and maintenance.

Organizations:

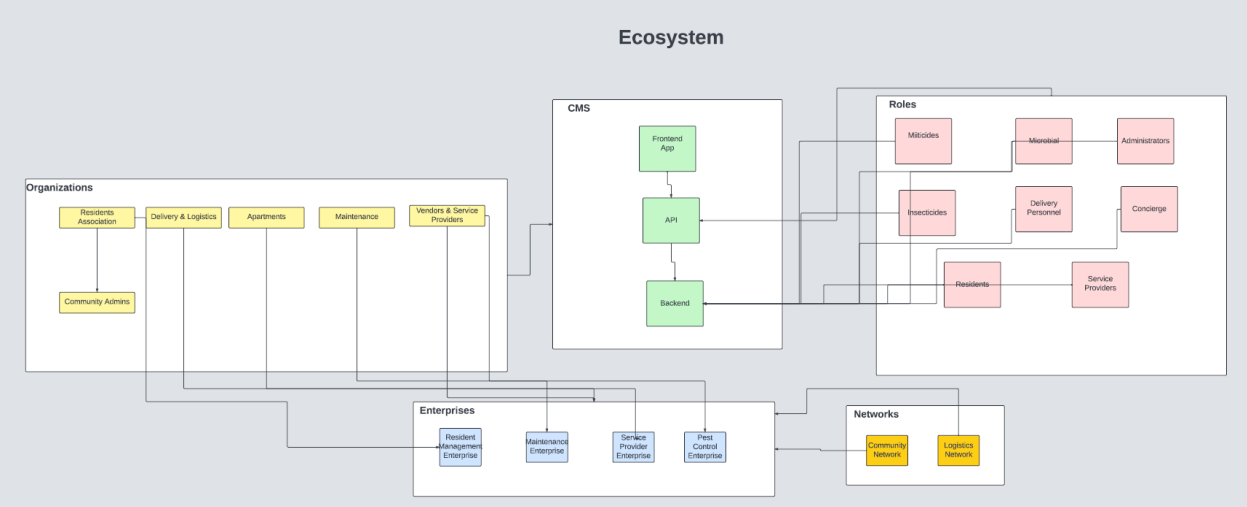
- **Residents Association**: Represents the residents, handles their needs, and maintains the community's functioning.
- **Security Firm**: Provides security staff and oversees the community's safety.
- **Vendors and Service Providers**: Includes third-party service providers for maintenance, cleaning, landscaping, and other needs.
- **Delivery and Logistics**: Handles delivery and logistics for items being delivered to the residents.
- **Community Admins**: Manages the overall administration of the community, setting policies, rules, and procedures.
- **Maintenance and Support**: Ensures that all infrastructure and community facilities are well-maintained and operational.

Roles:

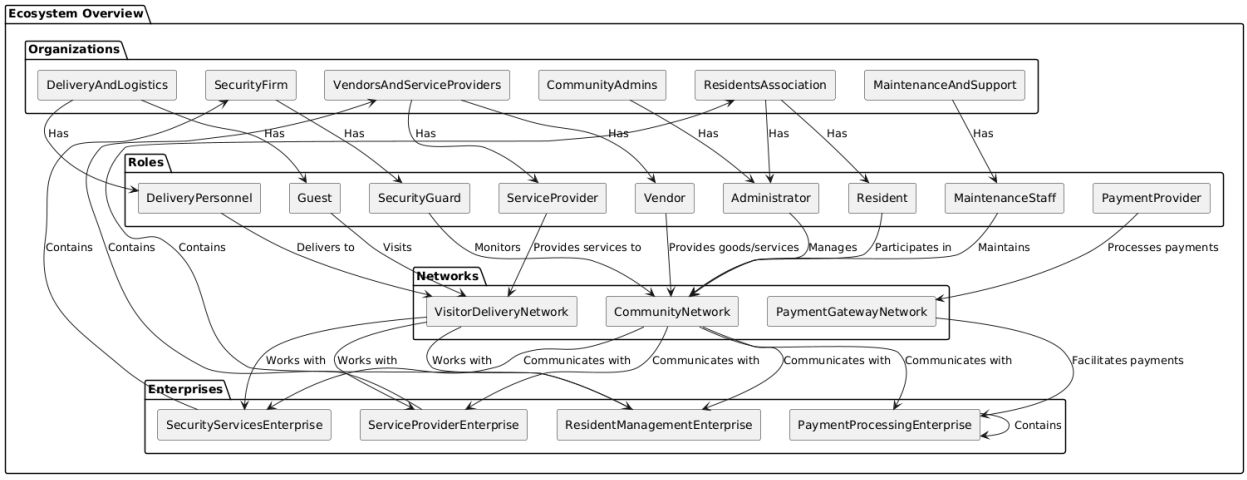
1. Residents: Participate in the community system, interact with the network, and request services.
2. Administrators: Oversee the system, manage residents, services, and policies.
3. Delivery Personnel: Responsible for delivering packages and items to residents.
4. Insecticides Team: Specializes in controlling insect pests in the community.
5. Microbial Team: Focuses on managing microbial pests and ensuring proper pest control.
6. Miticides Team: Responsible for managing and controlling mite infestations within the community.

7. Maintenance Staff: Responsible for maintaining infrastructure and managing any repairs.
8. Concierge: Assists residents with booking services, handling requests, and providing personalized support.

Ecosystem Structure:
Updated



Old:



2.2 Use Cases

1. Resident Use Case

Scenario: A resident requests a maintenance service.
Steps:

1. Resident logs into the community system (CMS).
2. Resident submits a request for a maintenance service (e.g., plumbing or electrical repair)
3. .Concierge confirms the request, schedules a visit, and updates the resident.
4. Maintenance staff attends to the issue and updates the CMS with the completion status.
5. Resident is notified that the service is completed.

---

2. **Administrator Use Case**

- Scenario: An administrator generates a financial report.
  Steps:
- Administrator logs into the CMS and accesses the reporting module.
- Administrator selects the time range and category (e.g., payments, maintenance costs).
- Administrator exports the report and shares it with the management team or residents if necessary.
- The report is available for transparency and decision-making.

---

3. Delivery Personnel Use Case

Scenario: Delivery of a package to a resident.
Steps:

- Delivery personnel arrives at the security gate with a package and logs in with the package details.
- Security personnel verifies the delivery details using the CMS.
- Security grants one-time access for delivery.
- Delivery personnel drops off the package at the designated location.
- The CMS is updated to confirm successful delivery.

---

4. Insecticides Team Use Case

Scenario: Insect pest control request.
Steps:

1. A resident reports an insect infestation through the CMS.
2. The Insecticides Team is notified of the request.
3. The Insecticides Team schedules a pest control visit.
4. The team applies insecticides and addresses the issue, updating the CMS with the details.
5. Resident is notified that the pest control treatment has been completed.

---

5. Microbial Team Use Case

Scenario: Microbial pest management request.
Steps:

1. A resident reports microbial pest-related issues (e.g., mold, bacteria) through the CMS.
2. The Microbial Team is notified and schedules an assessment visit.
3. The team investigates the issue, applies microbial treatments, and documents the actions in the CMS.
4. Resident is informed about the applied treatment and outcomes.

---

6. Miticides Team Use Case

Scenario: Mite infestation management.
Steps:

1. A resident reports a mite infestation (e.g., dust mites, spider mites) through the CMS.
2. The Miticides Team is notified and schedules an intervention visit.
3. The team applies miticides or treatments to the affected areas.
4. The system is updated with the treatment details, and the resident is notified about the completion.

---

7. Maintenance Staff Use Case

Scenario: A broken appliance is reported by a resident.
Steps:

1. A resident submits a request for appliance repair through the CMS.
2. Maintenance staff receives the request and schedules a time for the repair.
3. Maintenance staff visits the location, repairs the appliance, and updates the CMS with the status.
4. The resident is notified when the repair is complete.

---

8. Concierge Use Case

Scenario: A resident requests assistance with booking a community amenity (e.g., gym, clubhouse).
Steps:

1. The resident contacts the Concierge through the CMS, requesting a booking for a community amenity.
2. The Concierge checks availability and confirms the booking.
3. The Concierge schedules the booking in the CMS and provides confirmation to the resident.
4. Resident receives confirmation and any additional details related to the booking.