



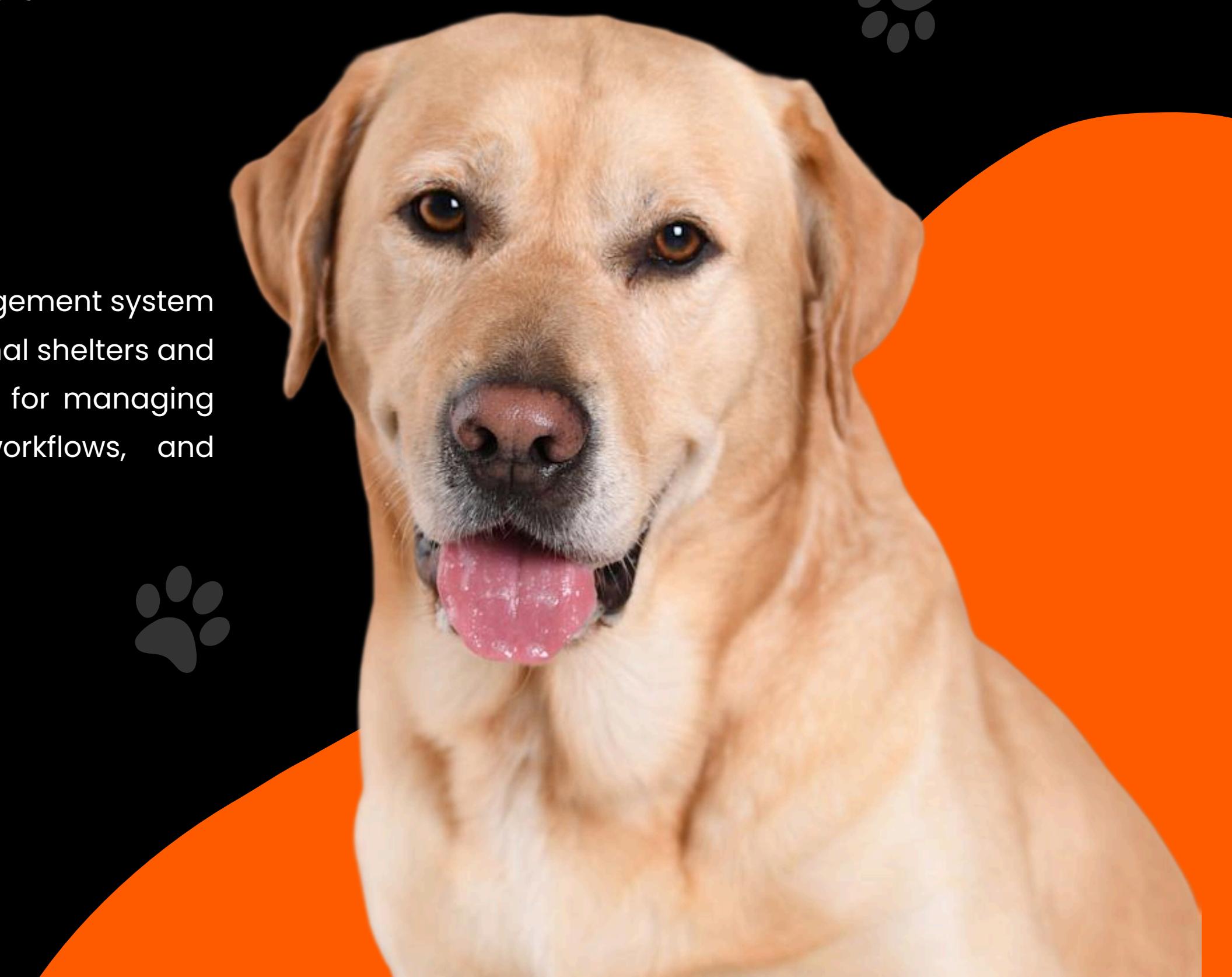
PawRes

Animal Rescue Management System



Problem Overview

PawRes is a comprehensive animal rescue and adoption management system developed to address the operational challenges faced by animal shelters and rescue organizations. The platform provides a unified solution for managing emergency rescue reports, animal records, adoption workflows, and organizational analytics.





Problem

Animal shelters traditionally rely on fragmented tools spreadsheets, phone calls, paper forms, and social media leading to:

- Inefficient rescue coordination: Delayed response times due to unstructured reporting
- Data integrity issues: Inconsistent records across multiple systems
- Poor visibility: Lack of real-time insights for decision-making
- Security gaps: Inadequate access controls and audit trails



Solution

PawRes delivers an integrated desktop/web application built with the Flet framework that provides:

- Centralized rescue reporting with GPS integration and photo uploads
- Complete animal lifecycle management from intake to adoption
- Streamlined adoption workflows with automated status management
- Role-based access control separating admin and public user functions
- Real-time analytics dashboards with interactive charts
- AI-powered breed classification for faster animal intake processing
- Comprehensive audit logging for security compliance





Target Users

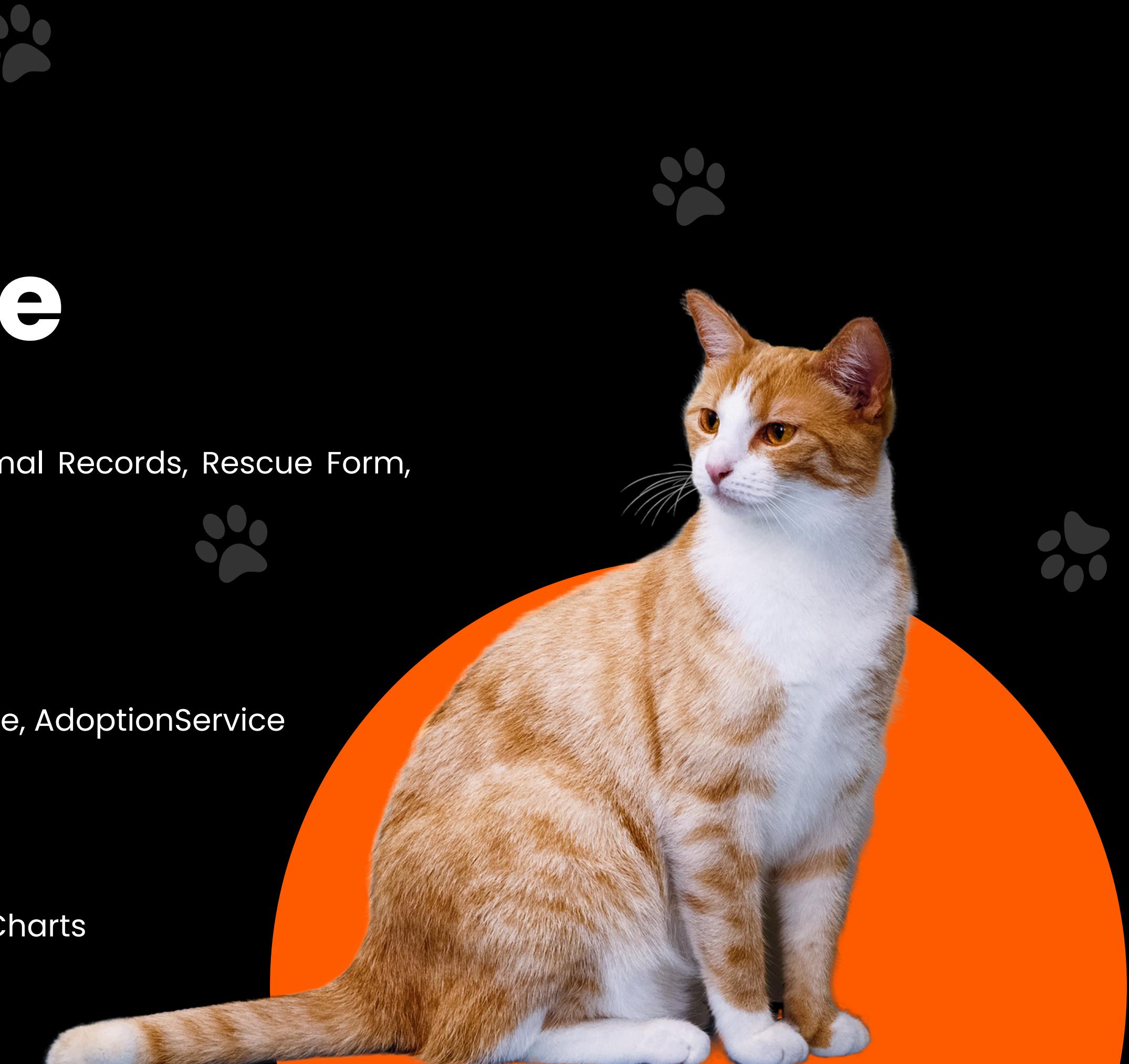
- Animal shelters
- Rescue volunteers
- Adopters / general public
- Shelter administrators
- Local government or NGOs involved in animal welfare

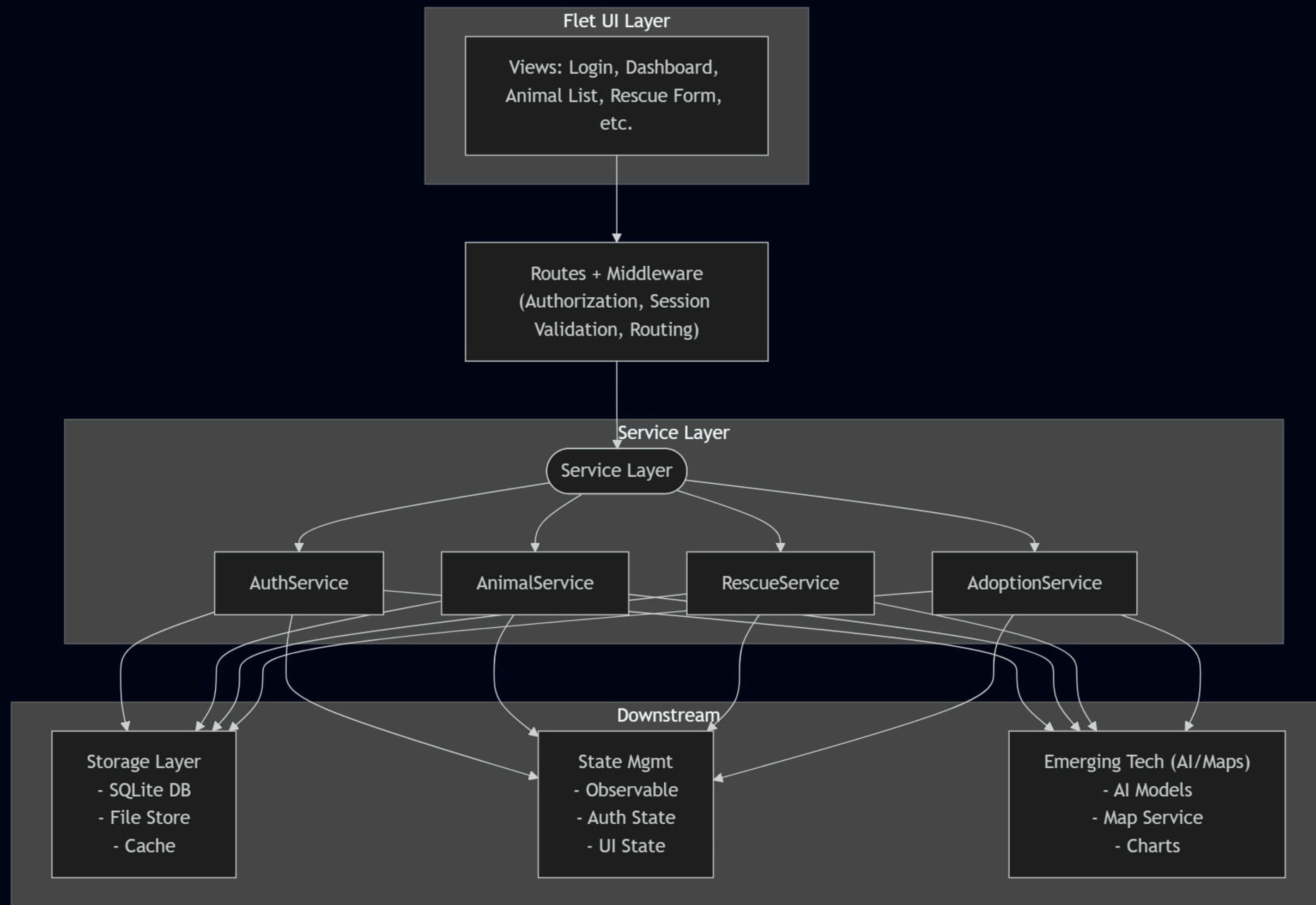
Architecture & Tech Stack



High-Level Architecture

- Frontend Layer
 - Desktop/Web UI (Login, Dashboard, Animal Records, Rescue Form, etc.)
- Middleware
 - Routing, Authorization, Session Validation
- Service Layer
 - AuthService, RescueService, AnimalService, AdoptionService
- Storage Layer
 - SQLite DB, File storage, cache
- Emerging Tech Layer
 - AI classifiers, Map/geolocation services, Charts







Technology Stack

Frontend: Flet 0.28.3 (Python → Flutter)

Backend: Python 3.x

Database: SQLite (FK constraints, cascading deletes)

AI/ML:

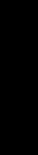
- PyTorch, HuggingFace Transformers
- ViT species detection
- Custom dog breed (120 classes) & cat breed models (48 classes)
- Visualization: Matplotlib, Plotly, Flet Native Charts
- Geolocation: flet-map, geopy (Nominatim)
- Authentication:
- PBKDF2-HMAC-SHA256 (100k iterations)
- OAuth 2.0 Google Sign-In + PKCE
- Testing: pytest + coverage tools





Core Feature Walkthrough





Admin Features

- Dashboard Analytics (charts, metrics)
- Rescue Management (review, update statuses)
- Animal Record Management
- CRUD + AI breed classification + photo uploads
- Adoption Review Workflow
- Approve/deny, messaging, auto-status update
- User Management (enable/disable, reset password)
- Audit Logs (auth, admin actions, security events)
- Data Import/Export (CSV/Excel)
- Archive Management (restore deleted items)



Regular User Features

- Emergency Rescue Reporting (no login required)
- Rescue Tracking (status updates)
- Animal Browsing (adoptable animals)
- Adoption Application (digital processing)
- Profile Management (Google link, password, info)
- Personal Analytics (charts for activities)





Emerging Tech Deep Dive



AI Classification Service

Purpose: Accelerate animal intake processing

Models Used:

- ViT (species)
- Dog Breed Classifier – 120 breeds ($\approx 86.8\%$ accuracy)
- Cat Breed Classifier – 48 breeds ($\approx 77\%$ accuracy)

Features:

- Philippine breed support (Aspin/Puspin)
- Resumable model downloads
- Confidence scoring



Interactive Maps

- Purpose: Rescue coordination & location tracking
- Tech: flet-map + OpenStreetMap
- Address ↔ Coordinates conversion
- Marker placement & geocoding
- Offline fallback

Data Visualization

- Line, bar, pie charts
- Interactive dashboards with tooltips
- Real-time insights for rescues/adoptions



🐾 Add New Animal

Register a new animal in the system

📷 Animal Photo

[+ Add Photo](#)[✨ Analyze with AI](#)

✨ AI Suggestion

🐕 Species: Dog 71.0%

🐾 Aspin (Mixed Breed)

Possible breeds: Whippet (25.7%), Saluki (21.5%)

[✍ Enter Manually](#)[✓ Use Suggestion](#)

🐾 Animal Details

Animal Type

Animal Name

 Paw Rescue

Management System

- Admin Dashboard
- View Animal List
- Manage Records**
- View Data Charts
- User Management
- Audit Logs

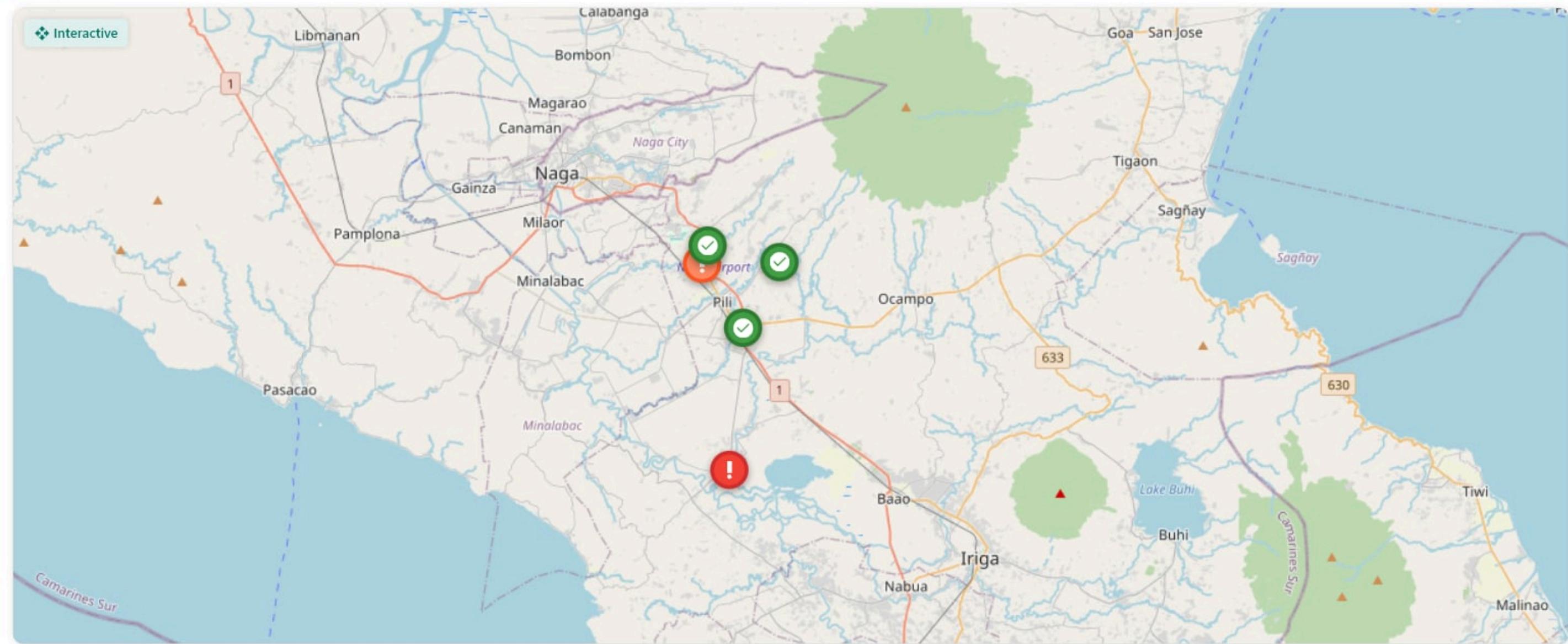
 Admin User
• Online >

Logout

#32	Beans	Dog	Not Specified	vince@gmail.com	Cadlan, Camarines Sur, Bicol R...	Nakulong na ayam	Medium	User #4	Cancelled		
#31	asef asdf asdf	Cat	Puspin (Mixed B...)	vince@gmail.com	Anayan, Pili, Camarines Sur	Nakulong na kuting	High	Emergency	Rescued		

Realtime Rescue Mission Map

Click map to enable pan & zoom


The map displays a coastal region with several towns and landmarks labeled: Libmanan, Calabanga, Bombon, Magarao, Canaman, Naga City, Gainza, Pamplona, Milaor, Minalabac, Pasacao, Sagñay, Tigaon, Sagñay, Sagñay, Lake Buhi, Baao, Nabua, Iriga, and Malinao. A network of roads is shown, with route numbers 1, 633, and 630. Seven rescue mission locations are marked with green circles containing checkmarks, indicating they are 'Done'. One location is marked with a red circle containing an exclamation point, indicating it is 'High' priority. Another location is marked with a red circle containing a question mark, indicating it is 'Med' priority.

Interactive

7 locations

High Med Low Done

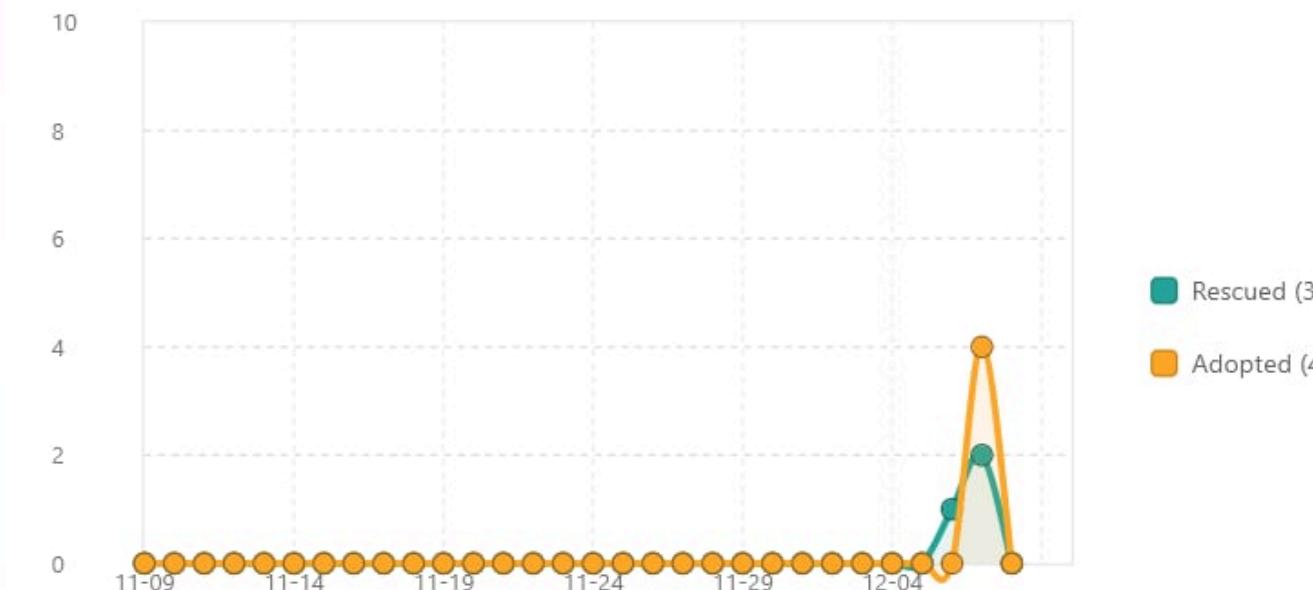


Paw Rescue

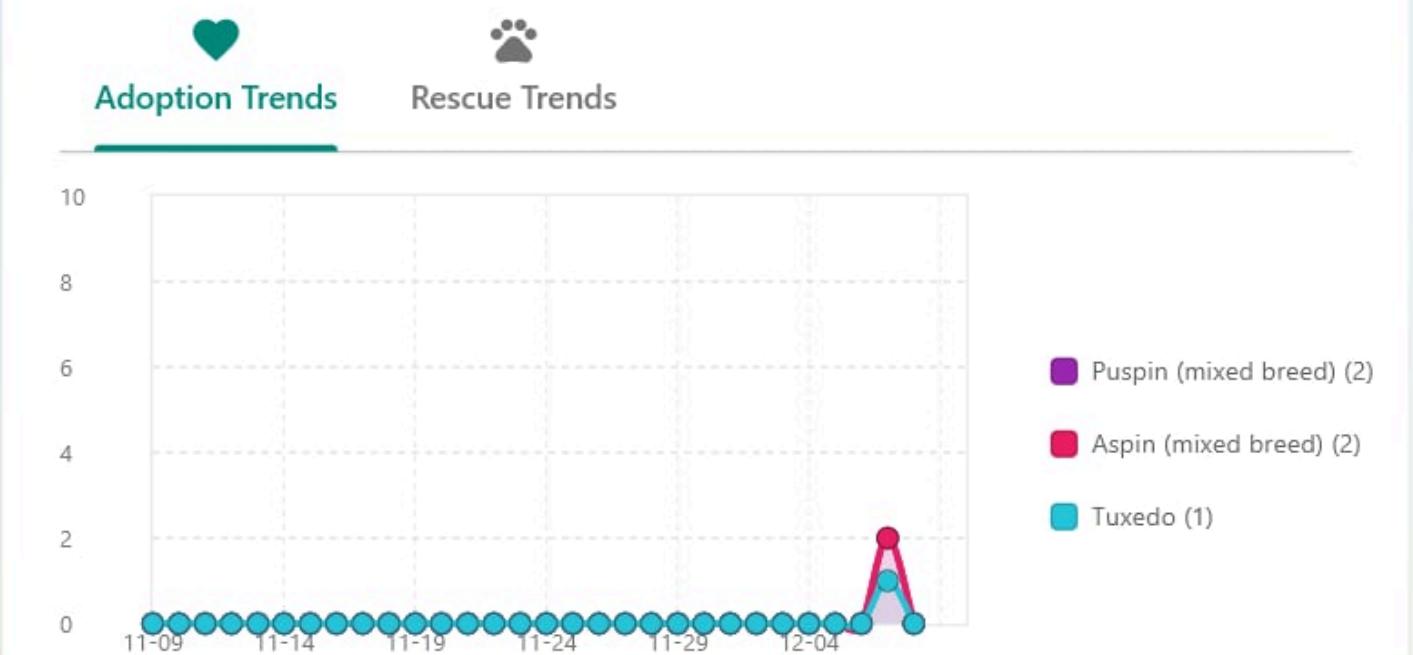
Management System

[Admin Dashboard](#)[View Animal List](#)[Manage Records](#)[View Data Charts](#)[User Management](#)[Audit Logs](#)

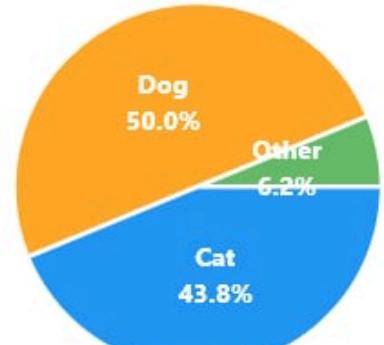
Rescued vs. Adopted (Last 30 Days)



Top 3 Breed Trends (Last 30 Days)

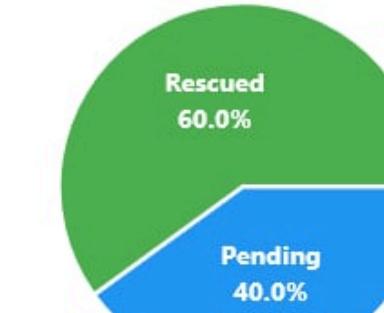


Animal Type Distribution



Cat (7)
Dog (8)
Other (1)

Rescue Mission Status



Pending (2)
On-going (0)
Rescued (3)
Failed (0)

Adoption Request Status



Pending (1)
Approved (4)
Denied (0)

Admin User
● Online

[Logout](#)

A large black dog is the central figure on the left side of the image. The dog is wearing a dark baseball cap, dark sunglasses, and a thick gold chain necklace. It is positioned within a large, solid orange circle. The background of the entire image is black. There are six smaller, dark gray paw prints scattered around the text area.

Security Overview

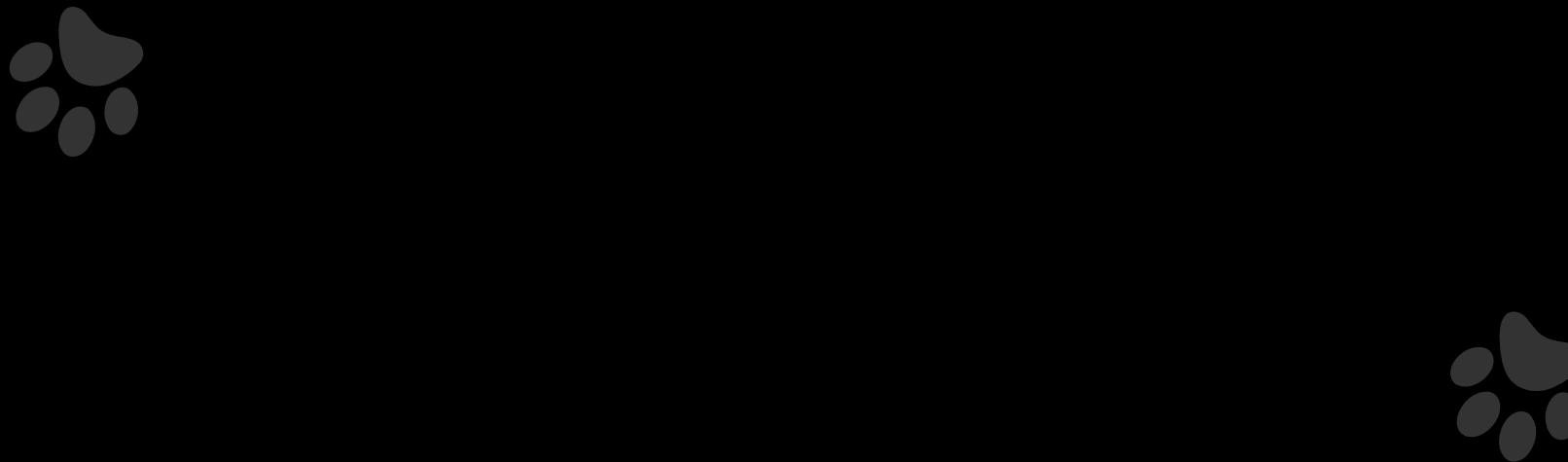
Multi-Layer Security Model

- Transport Layer
 - HTTPS/TLS 1.2+
- Authentication
 - Password login with PBKDF2-HMAC-SHA256, unique salt per user
 - Google OAuth 2.0 with PKCE
 - Brute-force protection: Lockout after 5 failed attempts
- Authorization
 - Role-Based Access Control (RBAC): admin, user
 - Route middleware enforcing authentication, roles, and session timeout
- Session Security
 - Auto-logout after 30 min inactivity
 - Constant activity timestamp checking
- Account Protection
 - Admin ability to disable users
 - Login attempt tracking + lockout timer



Lessons Learned + Future Work





Lessons Learned

- Importance of clean architecture for scaling
 - Need for strong security, especially RBAC and audit logs
 - AI integration requires careful model packaging & performance handling
 - Maps/geocoding require error handling and offline fallback
 - Testing improved stability but requires more coverage
- 



Future Enhancements

- Email/SMS notification system
- Cloud storage for images/files
- Mobile native app (iOS/Android)
- PDF report generator
- Volunteer & foster care management
- Medical & vaccination tracking
- Donation management

Thank You

FOR YOUR ATTENTION

"Every rescued animal is a life rewritten with hope."

