Synopsis

1. Introduction

Pet welfare organizations, shelters, and veterinary clinics play a crucial role in safeguarding animals and improving adoption rates. However, most operations today remain fragmented—adoption records, rescue activities, veterinary health data, donation management, and abuse reporting are often handled separately using paper records, spreadsheets, or unlinked software. This results in delays, miscommunication, poor data visibility, and limited collaboration between stakeholders such as shelters, veterinarians, animal welfare officers, and the public.

This project proposes the development of a Centralized Pet Welfare & Management System (CPWMS)—a unified digital platform that integrates adoption management, rescue operations, veterinary care, donation tracking, legal case management, and AI-powered tools. The system will streamline workflows, improve data accuracy, and create a transparent, efficient ecosystem for all stakeholders involved in pet welfare.

2. Problem Statement

The lack of a centralized system for pet welfare leads to several issues:

- Fragmented data across shelters, veterinary hospitals, and welfare groups.

- Delays in pet adoption and difficulty in tracking rescued animals.

- Poor monitoring of vaccination, disease prevention, and medical treatments.

- Limited transparency in donations and sponsorships.

- Difficulty in reporting abuse cases and coordinating legal actions.

- Lack of AI-driven tools for disease prediction, pet tracking, or breed recognition.

To address these issues, there is a need for a cost-effective, scalable, and intelligent platform that enables seamless coordination across all areas of pet welfare.

3. Objectives

The main objectives of CPWMS are:

- Centralize adoption, shelter, rescue, and veterinary management.

- Maintain detailed pet profiles including health, vaccination, and genetic data.

- Enable public reporting of rescues, lost pets, and abuse cases.

- Provide AI-based tools for breed detection, disease prediction, and behavior analysis.

- Support transparent donation and sponsorship tracking.

- Offer role-based access for administrators, vets, adopters, and the public.

- Conduct online adoption drives, vaccination camps, and awareness events.

- Provide e-commerce support for pet supplies and medical products.

4. Scope of the Project

4.1 Adoption & Shelter Management

- Maintain pet profiles with history, health, and vaccination details.

- Track animal intake, behavior, and availability for adoption.

- Multi-shelter support with staff and resource management.

4.2 Street Animal Rescue & Abuse Reporting

- Public interface to report rescues, injuries, and abuse cases.

- Case tracking with welfare officer/legal authority involvement.

4.3 Veterinary Management

- Health records, e-prescriptions, and vaccination scheduling.

- Telemedicine and AI-based diagnosis support.

4.4 Donation & Sponsorship

- Transparent donation management for shelters and treatments.

- Sponsorship system for long-term pet care.

4.5 Events & Awareness

- Organize adoption drives, vaccination camps, and workshops.

- Public engagement through campaigns and volunteer registration.

4.6 AI & Smart Features

- AI-powered disease and behavior prediction.

- GPS-enabled lost pet tracking.

- Chatbot assistance for adopters and general queries.

4.7 Role-Based Access Control (RBAC)

- Admins, shelter staff, vets, adopters, and public users will have secure, role-specific access.

5. Technologies Used

- **Frontend:** React.js for responsive and modular user interface.

- **UI Styling:** TailwindCSS for clean, mobile-friendly design.

- **Backend:** Node.js with Express.js for REST API and business logic.

- **Database:** MongoDB for flexible, document-based storage.

- **Authentication:** JWT tokens for secure access with RBAC.

- **AI Integration:** TensorFlow/PyTorch for image recognition and disease prediction.

- **Cloud & APIs:** Cloud hosting, payment gateways, and map/notification APIs.

6. Feasibility Analysis

Technical Feasibility
The MERN stack and AI models are open-source and well-documented, making them reliable and scalable. Cloud deployment ensures availability and easy integration with APIs.

Economic Feasibility
The project leverages free/open-source tools, reducing licensing costs. Main expenses will be limited to hosting and storage, making it cost-effective for NGOs and welfare groups.

Operational Feasibility
The system is intuitive, web-based, and mobile-friendly. With role-based dashboards, stakeholders can adopt it with minimal training.

7. Expected Outcomes

- Faster and more transparent adoption and rescue processes.

- Better health and vaccination tracking through centralized veterinary records.

- Increased public participation in rescue and welfare activities.

- Transparency in donations, increasing trust and contributions.

- AI-driven insights to reduce disease spread and improve pet care.

- Stronger collaboration between shelters, vets, and animal welfare officers.

8. Future Enhancements

- IoT-based wearable sensors for real-time health and activity monitoring.
- Mobile app with offline rescue reporting support.
- Integration with government pet registration and licensing systems.
- AI-driven pet–adopter compatibility matching.