PETMEDIX

Pet Care Management Web Application

Project Report

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1. Introduction

The Pet Care Management System is a comprehensive web-based platform designed to simplify the responsibilities of pet ownership while ensuring optimal health management and community engagement. It provides a unified solution for **pet owners** to manage their pets' medical, growth, and social needs, while enabling **administrators** to oversee doctors, hospitals, and system operations efficiently.

This system integrates innovative features such as **machine learning–based skin disease prediction, vaccination and health reminders via email notifications, telemedicine booking with Jitsi integration, and a community platform for pet owners.**

2. Objectives

- To provide a **centralized platform** for pet owners to manage multiple pets individually.
- To improve **pet healthcare management** by maintaining growth, medical, and vaccination records.
- To facilitate **seamless communication** between pet owners, doctors, and hospitals.
- To empower users with **AI-based skin disease prediction** tools.
- To build a **community ecosystem** for pet owners to share experiences, announcements, and events.
- To enable administrators to **manage system operations**, including doctors, hospitals, and overall monitoring.

3. User Roles and Functionalities

3.1 Pet Owners

Pet owners are the primary users of the system. Each pet can be managed separately, ensuring that multiple pets are handled without confusion. Key features include:

1. **Pet Account Management**
    - Create separate profiles for each pet.
    - Update personal details, growth records, and medical histories.
2. **Health and Medical Management**
    - Maintain vaccination records and receive reminders for upcoming doses.
    - Update vaccination history after each procedure.
    - Record growth metrics and calculate BMI for pets.
3. **Doctor Appointment System**
    - Book physical and online checkups based on doctors' available schedules.
    - Receive auto-generated **Jitsi meeting links** for online consultations.
    - Notifications for appointment reminders and updates.
4. **Machine Learning Disease Prediction**
    - Upload skin images of pets.
    - Predict potential skin diseases using the integrated ML-based model.
    - Receive preventive and advisory guidance based on predictions.

5. **Pet Owner Community**
    - Share posts and updates about pets.
    - Report missing pets, post about pet adoption opportunities, and announce free pet camps.
    - Engage with other pet owners through comments and discussions.
6. **Notifications & Alerts**
    - Automatic **email (Gmail) notifications** for vaccination reminders, checkup schedules, and important updates.
    - System-generated alerts on the dashboard for all active pets.
7. **Dashboard**
    - Clear, user-friendly dashboard displaying:
        - Pet details (age, breed, medical records).
        - Upcoming vaccinations and appointments.
        - Growth tracking insights and BMI information.

3.2 Administrators

Administrators ensure the system runs smoothly while managing healthcare professionals and facilities. Their features include:

1. **Doctor Management**
    - Add, update, and remove doctors.
    - Manage doctors' schedules and availability.
    - Monitor appointment bookings and consultation updates.
2. **Hospital Management**
    - Add and manage hospitals/clinics linked to the system.
    - Maintain details such as location, services, and facilities.
3. **System Monitoring**
    - Track system usage by pet owners and doctors.
    - View reports on appointments, vaccination updates, and overall user activity.
4. **Community Oversight**
    - Monitor pet owners' community posts.
    - Approve or manage sensitive content related to missing pets, free camps, or adoption announcements.

4. Core Features

1. **Pet Profile Management** – Separate accounts for each pet with growth and health history.
2. **BMI Calculator** – Calculate and track BMI for pets to monitor health trends.
3. **Machine Learning Disease Predictor** – AI model for skin disease detection in pets.
4. **Appointment Booking System** – Physical and online checkups with Jitsi integration.
5. **Vaccination Management** – Records and reminders for each vaccination.
6. **Community Platform** – Social features for pet owners to connect.
7. **Notification System** – Automated email alerts and dashboard reminders.
8. **Admin Panel** – For managing doctors, hospitals, and system activities.

5. Technology Stack

- **Frontend:** React.js / Tailwind CSS
- **Backend:** Node.js (Express.js Framework)
- **Database:** MongoDB (NoSQL for scalable record management)
- **Machine Learning Model:** Python-based model (Mobilenet+Finetuning)
- **Video Conferencing:** Jitsi Meet API
- **Notifications:** Nodemailer (Gmail integration)

6. Benefits of the System

- Centralized record management for multiple pets.
- Improved pet healthcare through timely reminders and predictive analytics.
- Convenient online consultation reducing travel and time for pet owners.
- Enhanced user engagement through the pet owners' community.
- Increased transparency and efficiency for admins in managing doctors and hospitals.
- Future scalability for integrating more AI features and advanced healthcare analytics.

7. Future Enhancements

- Mobile application support for Android and iOS.
- Integration with wearable IoT devices (pet collars for health tracking).
- Advanced ML models for broader disease prediction.
- Payment gateway integration for online checkups.
- Push notification system in addition to Gmail alerts.

8. Conclusion

The Pet Care Management Web Application serves as a **holistic platform** for pet owners and administrators alike. By combining healthcare management, community engagement, machine learning–based disease prediction, and telemedicine features, it addresses critical challenges faced by modern pet owners. With its strong foundation and scalability, this system has the potential to revolutionize pet healthcare and ownership management.