

# PawNect Virtual Pet Consultation Platform

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**Abstract**—The rapid growth of pet ownership has created significant demand for accessible and reliable veterinary services. Traditional in-person consultations are often time-consuming, geographically limited, and inconvenient for pet owners. This paper presents PawNect, a Virtual Pet Consultation Platform designed to connect pet parents with verified veterinary doctors through real-time video consultations using Zoom integration. The platform incorporates a community-based question-and-answer system, enabling pet owners to post queries and engage with other users and veterinary professionals. The system is developed using a modern three-tier architecture comprising an Angular-based frontend web application, a Node.js with Express backend, and a MongoDB Atlas cloud database. Two primary user roles are supported: Pet Parent and Veterinary Doctor, each with distinct capabilities including appointment booking, license-based doctor registration, admin-approved access, and community interaction. PawNect aims to enhance accessibility, efficiency, and transparency in pet healthcare by leveraging modern web technologies and telehealth practices.

**Index Terms**—Virtual veterinary consultation, Telehealth for pets, Pet care platform, Angular, Node.js, MongoDB, Zoom API, Community Q&A.

## I. INTRODUCTION

The pet care industry has witnessed exponential growth in recent years, with millions of households worldwide keeping pets as companions. As pet ownership increases, so does the demand for professional veterinary guidance. However, pet owners frequently encounter barriers when seeking expert care, including geographical distance from qualified veterinarians, long waiting times at clinics, and the stress of traveling with animals, particularly in emergency situations.

Digital transformation has revolutionized healthcare across multiple domains, and veterinary services are

no exception. Telehealth platforms have proven effective in human healthcare by providing remote consultation services, and similar approaches can be applied to veterinary medicine. A virtual consultation platform allows pet owners to seek professional advice from the comfort of their homes, reducing stress for both the pet and the owner while saving significant time and resources.

PawNect is a web-based Virtual Pet Consultation Platform designed to bridge the gap between pet parents and qualified veterinary professionals. The system facilitates real-time video consultations via Zoom integration, enabling timely and convenient access to expert veterinary advice.

Additionally, PawNect incorporates a community-based question-and-answer module, allowing users to post pet-care queries, share experiences, and receive responses from both veterinarians and fellow pet owners.

The platform is built on a modern technology stack: Angular for the frontend, Node.js with Express for the backend, and MongoDB Atlas as the cloud database. This architecture ensures scalability, performance, and a seamless user experience across devices and browsers.

## II. LITERATURE SURVEY

Telehealth and digital consultation platforms have attracted significant research interest in recent years, particularly following the accelerated adoption of digital services during global health disruptions. Several studies have examined the effectiveness and user adoption of virtual consultation platforms in healthcare and educational contexts.

Huang et al. conducted a comprehensive review of AI-powered chatbot and digital advisory systems, finding that such platforms significantly reduce wait times and

improve access to professional advice in remote and underserved areas [1]. Their findings strongly support the application of similar frameworks in veterinary services, where geographic barriers are a primary challenge for pet owners.

Ling and Jan explored the integration of digital tools in professional consultation settings, emphasizing that user trust and platform reliability are key determinants of adoption [2]. They concluded that systems incorporating verified professional credentials and secure communication channels yield higher user satisfaction and platform retention rates.

Yin, Goh, and Hu examined user interaction patterns in digital consultation environments and highlighted the importance of community-driven features in sustaining engagement [3]. Their study found that Q&A forums and peer-to-peer interactions significantly improve user retention and facilitate knowledge sharing beyond formal consultation boundaries.

Desai analysed the growing role of technology in modernizing healthcare services, noting an increasing willingness among users to adopt digital platforms for consultations [4]. Al Husaeni et al. further identified that web-based platforms with integrated communication tools are particularly effective in improving healthcare accessibility for broader communities [5].

These findings collectively support the development of PawNect, a platform that combines verified professional access, real-time video consultation, and community engagement to address the identified gaps in pet healthcare accessibility.

### III. PROBLEM STATEMENT

Despite growing demand for veterinary services, pet owners continue to face significant challenges in accessing timely and reliable professional guidance. The traditional model of in-person veterinary consultation presents several limitations that PawNect aims to address:

- Pet owners in rural or semi-urban areas have limited access to qualified veterinarians, making it difficult to obtain timely advice for pet health issues.

- Physical clinic visits are stressful for animals and time-consuming for owners, especially for routine queries that do not require hands-on physical examination.
- There is no centralized, verified platform where pet owners can connect with licensed veterinary doctors for virtual consultations in a trusted environment.
- Pet owners lack a trusted community space to share experiences, post questions, and receive peer and professional responses in real time.
- The process of verifying veterinary credentials before consultation is often opaque on existing platforms, reducing user trust in online veterinary advisory services.

These challenges highlight the need for a secure, scalable, and user-friendly virtual pet consultation platform that integrates professional verification, real-time communication, and community interaction in a unified system.

## IV. METHODOLOGY

The development of PawNect follows a structured software development methodology comprising the following phases:

### A. Requirement Analysis

Functional and non-functional requirements were gathered by analysing the needs of pet parents and veterinary professionals. Key features identified include appointment booking, Zoom-based video consultation, license verification for veterinarians, admin approval workflow, and community Q&A functionality.

### B. System Design

The system architecture was designed as a three-tier model with a clear separation between the presentation layer (Angular), the business logic layer (Node.js with Express), and the data layer (MongoDB Atlas). Role-based access control was incorporated to distinguish between Pet Parent, Veterinary Doctor, and Administrator roles.

### C. Implementation

The frontend was developed using the Angular framework, providing a component-based, responsive web interface. The backend REST API was built using Node.js and Express, handling authentication,

appointment management, and community features. MongoDB Atlas was used for cloud-based data storage, ensuring scalability and high availability.

#### D. Zoom API Integration

The Zoom API was integrated into the backend to enable the creation and management of virtual consultation meetings. Pet parents can book appointments, and upon confirmation by a veterinarian, a Zoom meeting link is automatically generated and shared with both parties through their respective dashboards.

#### E. Testing and Evaluation

The system was tested using Google Chrome as the primary browser. Functional testing was performed to validate all user flows including registration, login, appointment booking, Zoom meeting access, and community interactions. Backend API endpoints were tested using Postman to ensure correctness and reliability of the REST API.

### V. SYSTEM ARCHITECTURE

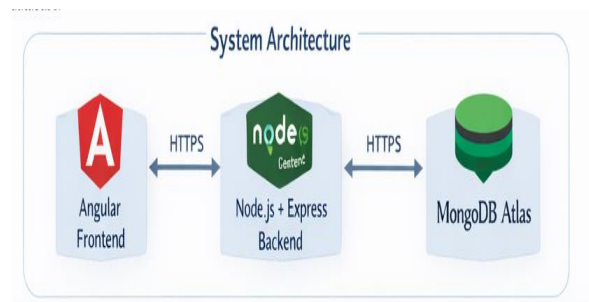


Fig. 1. PawNect System Architecture Overview

The PawNect system architecture is designed around a three-tier web application model, with clearly defined modules for each user role and system component.

#### A. Frontend (Angular Web Application)

The client-side is built using Angular, providing a dynamic single-page application experience. The frontend includes separate interfaces for Pet Parents, Veterinary Doctors, and Administrators, with components for registration, login, dashboard, appointment management, Zoom meeting access, and the community Q&A board.



Fig. 2. Frontend Module Structure

#### B. Backend (Node.js with Express)

The backend server exposes a RESTful API that handles all business logic including user authentication using JWT tokens, appointment scheduling, Zoom meeting generation via the Zoom API, and community post management. Middleware is used for route protection and role-based authorization.

#### C. Database (MongoDB Atlas)

MongoDB Atlas serves as the cloud-based NoSQL database. Collections are maintained for user profiles (pet parents and veterinarians), appointment records, community posts and answers, and veterinary license details pending admin approval.

#### D. Zoom Integration Module

This module interfaces with the Zoom API to create scheduled meetings when a veterinarian accepts a consultation request. Meeting links are stored in the database and made accessible to both parties through the dashboard interface.

#### E. Administrator Panel

A dedicated admin interface allows the platform administrator to review and approve veterinary doctor registrations based on submitted license credentials, ensuring only verified professionals are active on the platform.

Role	Capabilities	Tech Stack
Pet Parent	Register, Login, Book Appointment, Join Zoom Meeting, Post Community Questions	Angular, Node.js, MongoDB, Zoom API
Veterinary Doctor	Register with License, Await Admin Approval, Login, Accept/Reject Consultations, Answer Community Questions	Angular, Node.js, MongoDB, Zoom API
Administrator	Review and Approve Veterinary Doctor Registrations, Manage Platform Users	Angular, Node.js, MongoDB

Table I: User Roles and Capabilities

## VI. RESULTS

The implementation of PawNect demonstrates several measurable benefits for both pet owners and veterinary professionals. The platform successfully achieves its core objective of providing a centralized, secure, and accessible environment for virtual pet consultations. Pet parents are able to register on the platform, browse available verified veterinarians, and book consultation appointments through a streamlined interface. Upon appointment confirmation, a Zoom meeting link is automatically generated and accessible from the user dashboard, enabling a seamless virtual consultation experience without requiring third-party coordination.



Fig. 3. Appointment and Dashboard Interface

The veterinarian registration workflow incorporates license submission and admin approval, ensuring that only credentialed professionals are active on the platform. This significantly improves user trust and

platform reliability compared to unverified online advisory services.

The community Q&A module demonstrates strong potential for knowledge sharing, allowing pet owners to post questions and receive responses from both veterinarians and experienced community members. This feature reduces dependence on formal consultations for routine queries and fosters a self-sustaining peer support network within the platform. Overall, the system demonstrates improvements in accessibility, response time, and user experience compared to traditional veterinary consultation methods. Testing across Google Chrome confirmed consistent functionality for all primary user flows including registration, login, appointment booking, Zoom integration, and community interaction.

## VII. FUTURE SCOPE

PawNect can be significantly enhanced in future iterations by incorporating advanced technologies and expanding its service offerings:

- **AI-Based Health Tracking:** Artificial intelligence techniques can be integrated to analyse pet health data, recognize patterns, and provide proactive health recommendations based on historical records and behavioural inputs.
- **Smart Reminders:** Automated notification systems can be implemented to remind pet owners of vaccination schedules, medication timings, and upcoming appointments, improving adherence to veterinary care plans.
- **Wearable Device Integration:** Integration with IoT-enabled pet wearables can enable real-time monitoring of activity levels, heart rate, and sleep patterns, providing veterinarians with richer diagnostic data during virtual consultations.
- **Multilingual Support:** Expanding the platform to support multiple regional languages will broaden accessibility, particularly in multilingual countries like India, reaching a wider demographic of pet owners.
- **Mobile Application:** A dedicated mobile application for Android and iOS will improve platform accessibility and enable push notifications for appointment reminders and community activity.
- **Premium Subscription Model:** A tiered subscription system including free, standard, and premium plans can be introduced to offer unlimited consultations,

exclusive veterinary content, and personalized health tracking as value-added services.

### VIII. CONCLUSION

PawNect presents an efficient, scalable, and user-friendly solution for modernizing pet healthcare through virtual consultation technology. By connecting pet parents with verified veterinary professionals via Zoom-integrated appointments and a structured role-based platform, PawNect addresses the critical gap between pet owners' needs and the availability of professional veterinary guidance.

The community-based Q&A module further enhances the platform's value by enabling peer interaction and reducing the burden on formal consultation channels for routine pet-care queries. The three-tier architecture comprising Angular, Node.js with Express, and MongoDB Atlas ensures a robust, maintainable, and scalable system capable of serving a growing user base with diverse needs.

By implementing platforms like PawNect, the pet care industry can leverage digital transformation to improve the accessibility, quality, and convenience of veterinary services, ultimately enhancing the well-being of pets and the confidence of their owners in managing pet health effectively.

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