

## **PAWHUB: AI-Powered Dog Breed Identification & Pet Shop Platform**

Submitted to,  
Ms. Ajilisa O.A

Submitted by,  
Samyuktha Rajeev  
CA-674  
MCA B-19  
SSTM

## **PROBLEM STATEMENT**

PAWHUB aims to address the inefficiencies and challenges present in traditional pet shops by integrating artificial intelligence with a digital pet marketplace. One of the primary issues in conventional pet stores is the reliance on manual breed identification, which often results in inaccurate information being provided to customers. This misinformation can lead to poor purchasing decisions, especially for breeders and pet enthusiasts who need precise details about dog breeds. Furthermore, physical pet stores operate with outdated sales, inventory, and payment processing systems that lack automation and real-time tracking. This makes stock management challenging for shop owners, leading to inefficiencies, overstocking, or shortages. Customers, on the other hand, face difficulties in comparing pet breeds, prices, and product availability, often having to visit multiple stores to make an informed decision.

This problem is particularly relevant in today's digital age, where online shopping has become the norm. The pet industry is experiencing significant growth, with the global pet market valued at approximately \$261 billion in 2022, driven by increasing pet adoption and the expansion of e-commerce platforms. Pet owners are looking for more convenient, reliable, and data-driven solutions for purchasing pets and pet-related products. Traditional pet stores, with their lack of technological integration, struggle to meet these modern expectations, creating a need for an advanced, AI-driven solution.

PAWHUB addresses these challenges by offering a comprehensive digital platform that enhances accuracy, efficiency, and convenience in pet shopping. Its AI-powered breed identification system, utilizing Convolutional Neural Networks (CNNs), ensures that customers receive accurate breed predictions by simply uploading an image. This technology is particularly beneficial for breeders, pet enthusiasts, and shop owners who require precise breed authentication. Additionally, the platform streamlines inventory and sales management by automating processes, enabling real-time tracking, and providing a seamless shopping experience. With features such as secure online payments, delivery and return management, and a premium membership program, PAWHUB transforms the pet shopping industry into a more intelligent, efficient, and user-friendly ecosystem.

## **OBJECTIVES**

The primary aim of PAWHUB is to revolutionize the pet shop industry by integrating AI-driven dog breed identification with a seamless e-commerce platform. The system is designed to enhance accuracy in breed recognition, streamline inventory and sales management, and provide a convenient and user-friendly experience for customers, pet shop owners, suppliers, and administrators. By leveraging artificial intelligence and automation, PAWHUB seeks to modernize the pet shopping experience, making it more efficient, reliable, and accessible.

### **Specific Objectives**

#### **1. AI-Powered Dog Breed Identification**

- Develop an advanced Convolutional Neural Network (CNN) model to accurately predict dog breeds from uploaded images.
- Provide detailed breed insights, including characteristics, health information, and care recommendations.

#### **2. User-Friendly Interface**

- Design an intuitive and interactive web-based platform that ensures easy navigation for customers, suppliers, and administrators.
- Implement a seamless user experience with responsive design and clear categorization of products and services.

#### **3. Automated Sales and Inventory Management**

- Enable real-time tracking of stock availability to help suppliers and pet shop owners manage inventory efficiently.
- Automate order processing, ensuring accurate record-keeping and minimizing errors in transactions.

#### **4. Secure Online Payment Integration**

- Implement multiple secure payment gateways, including digital wallets, credit/debit cards, and online banking.
- Ensure data encryption and secure transaction handling to protect user information.

## **5. Seamless Delivery and Return System**

- Integrate an efficient logistics module that allows customers to track orders in real time.
- Develop a hassle-free return and refund system to enhance customer trust and satisfaction.

## **6. Role-Based Access and User Management**

- Establish different user roles, including administrators, suppliers, customers, and couriers, with appropriate access privileges.
- Ensure data security and operational efficiency through structured role management.

## **7. Premium Membership Program**

- Offer exclusive benefits, such as discounts, early access to sales, and priority delivery, to premium users.
- Enhance customer retention and engagement through personalized recommendations and loyalty rewards.

## **8. Comprehensive Reporting and Analytics**

- Provide business insights through sales reports, customer behavior analytics, and inventory tracking.
- Help pet shop owners make data-driven decisions to improve business performance

## **SCOPE OF THE PROJECT**

## **Boundaries of the Project**

### **What the System Will Do:**

#### **1. AI-Powered Dog Breed Identification:**

- Users can upload an image of a dog, and the system will predict the breed using a Convolutional Neural Network (CNN) model.
- Provides detailed breed information, including characteristics, health insights, and care guidelines.

#### **2. E-Commerce Functionality:**

- Allows customers to browse and purchase pet animals, food supplies, and accessories.
- Enables suppliers to manage product listings, stock levels, and pricing efficiently.

#### **3. Automated Sales and Inventory Management:**

- Tracks stock availability in real time to avoid shortages or overstocking.
- Generates automated sales reports and analytics for better business decision-making.

#### **4. Secure Online Payment Processing:**

- Supports multiple payment methods, including credit/debit cards, digital wallets, and online banking.
- Ensures secure transactions through encryption and fraud prevention measures.

#### **5. Seamless Order, Delivery, and Return Management:**

- Enables real-time order tracking for customers.
- Provides a structured return and refund policy to enhance user trust and satisfaction.

#### **6. Role-Based User Management:**

- Users are categorized into Administrators, Suppliers, Customers, and Couriers, each with specific access privileges.
- Ensures smooth operational control and security.



## **7. Premium Membership Program:**

- Offers exclusive benefits like discounts, early access to sales, and priority delivery for premium users.
- Enhances customer loyalty and engagement.

### **Limitations:**

#### **1. No Real-Time Veterinary Services:**

- The platform does not provide live veterinary consultations or emergency pet care services.

#### **2. No Physical Pet Adoption Services:**

- While the system facilitates pet purchases, it does not handle legal adoption processes or certification for rescue animals.

#### **3. Limited to Domestic Dog Breeds:**

- The AI breed identification system is focused on domestic dog breeds only and may not accurately identify mixed breeds or rare crossbreeds.

#### **4. Does Not Offer Personalized Pet Training or Grooming Services:**

- The system does not provide training programs or pet grooming services, though pet products related to these services may be available for purchase.

#### **5. Restricted to Online Transactions:**

- PAWHUB operates entirely online and does not facilitate in-store purchases or cash-on-delivery options.

## **Users**

There are three user characteristics in this system:

1. Admin
2. Supplier
3. Customer
4. Courier

### **1. Administrator**

Administrator or admin has all privileges on every process performed in the system. Admin can add, edit or view the details of product and supplier, make purchases and view all activity performed on the system.

### **2. Supplier**

Suppliers can add, update, or remove product listings, ensuring that the inventory remains up to date. They can also track orders, manage stock levels, and coordinate with the delivery team to fulfill customer purchases efficiently.

### **3. Customer**

The customer can only use the system to see the product details, price etc and add their desired items into the cart and make purchase using debit or credit cards. The customer later can view and edit the items in the cart before purchasing the product. The customer logs into the system by registering himself.

### **4. Courier**

Courier has less privileges compared to admin and staff. Courier is used to show the customer about the delivery details. The status details of product will be updated till the product has been delivered.

## **EXISTING SYSTEM**

Traditional pet shops operate through physical stores, where customers visit to purchase pet animals, food supplies, and accessories. These stores rely on manual breed identification, which can sometimes lead to incorrect information being provided to customers. Additionally, the sales and inventory management process is often handled manually or through basic systems that lack real-time tracking, making it difficult for suppliers and shop owners to manage stock efficiently. Payment processing is typically limited to cash or card transactions, with little to no integration of online payment gateways.

Moreover, there is no centralized platform where customers, suppliers, and administrators can seamlessly interact. Customers must physically visit multiple stores to compare pet breeds, prices, and available products. The absence of an AI-powered breed detection system makes it challenging for pet enthusiasts and breeders to verify the authenticity of a breed, often leading to confusion or misinformation.

Overall, the existing system is time-consuming, lacks automation, and provides limited accessibility to users, making it inefficient compared to modern digital solutions. Hence, there is a need for a technology-driven platform like PAWHUB, which integrates AI-based breed identification, automated inventory and sales management, seamless delivery systems, and a premium user experience, revolutionizing the pet shop industry.

### **Disadvantages of Existing System**

- Difficult in Maintenance of Records.
- Time Consuming.
- Data is not secure
- Chances of mistakes in long calculations.
- Proper Generation of Report may not be achieved

## **PROPOSED SYSTEM**

PAWHUB is an AI-powered web application designed to modernize the pet shop industry by integrating an advanced breed identification system with a seamless e-commerce platform. The system leverages a Convolutional Neural Network (CNN) model to analyze images uploaded by users and provide accurate breed predictions along with detailed insights such as breed characteristics, health recommendations, and care guidelines. This feature is particularly beneficial for pet enthusiasts, breeders, and pet shop owners who require reliable breed authentication. Beyond breed identification, PAWHUB offers a comprehensive online marketplace where customers can explore and purchase pet-related products, including live pets, food supplies, and accessories. The platform streamlines inventory management by allowing suppliers to update stock levels in real-time, reducing the risk of shortages or overstocking.

To enhance user experience, PAWHUB incorporates a secure payment gateway supporting multiple transaction methods, ensuring safe and efficient purchases. Additionally, the system features an integrated order management module that enables users to track their purchases, receive delivery updates, and access hassle-free return and refund services. The logistics module further optimizes the order fulfillment process by coordinating with delivery partners, ensuring timely shipping and real-time tracking of products. The platform also introduces a structured role-based access system, assigning specific privileges to administrators, suppliers, customers, and couriers, thereby enhancing security and operational efficiency.

A key highlight of PAWHUB is its Premium Membership Program, which offers exclusive benefits such as priority delivery, early access to special sales, and personalized product recommendations, ultimately improving customer engagement and retention. By combining AI-driven breed identification, automated sales processes, structured logistics, and a premium user experience, PAWHUB delivers a smarter, more efficient, and user-friendly pet shopping ecosystem. With a robust technological foundation, including Django for the backend, HTML/CSS/JavaScript for the frontend, SQLite for data storage, and AI-based CNN models, PAWHUB sets a new standard in the pet industry by providing a digital solution that ensures convenience, accuracy, and efficiency for all stakeholders.

### **Technology Stack:**

- Frontend: HTML, CSS, JavaScript, Bootstrap (for responsive UI)
- Backend: Django (Python-based web framework)
- Database: SQLite (for storing product, user, and order data)
- AI Model: Convolutional Neural Networks (CNN) for breed identification
- Payment Integration: Secure online payment gateways.
- Hosting & Deployment: Cloud-based hosting for scalability and accessibility

### **MODULES AND DESCRIPTION**

There are 7 modules in this project,

1. Comprehensive Store & Sales Management
2. Seamless Delivery & Logistics
3. Hassle-Free Returns & Refunds
4. User Access & Role Management
5. Effortless Order & Purchase Management
6. Exclusive Membership & Premium Services
7. AI-Powered Breed Identification & Management

#### **1. Comprehensive Store & Sales Management**

This module handles the entire product catalog, including pet animals, food supplies, and accessories. It manages pricing, inventory, and promotions, such as flash sales and discounts. The system also integrates a secure payment gateway, ensuring smooth and reliable transactions. Sales reports and analytics provide insights into customer preferences and business performance.

#### **2. Seamless Delivery & Logistics**

This module streamlines the order fulfillment process, ensuring efficient shipping, tracking, and on-time delivery. It allows customers to choose delivery options, track their

orders in real time, and receive notifications. Integration with logistics partners ensures seamless coordination, reducing delivery time and optimizing operational efficiency.

### **3. Hassle-Free Returns & Refunds**

The return management system allows customers to request returns or exchanges for eligible products, ensuring a smooth post-purchase experience. It includes a refund processing system, automated verification, and a status tracking feature. The module enhances customer trust by offering clear return policies and efficient dispute resolution mechanisms.

### **4. User Access & Role Management**

This module ensures a structured system where administrators, suppliers, and customers have appropriate access levels. It facilitates user registration, authentication, and account management, including password resets and profile customization. Administrators can approve or restrict user roles, maintaining security and operational control.

### **5. Effortless Order & Purchase Management**

This module efficiently handles order placements, cancellations, and payment confirmations. Customers can view their order history, receive invoices, and get automated updates about their purchases. Suppliers can manage stock availability to prevent order delays, ensuring a smooth purchasing experience.

### **6. Exclusive Membership & Premium Services**

The premium user management system offers subscription-based services, including exclusive discounts, early access to sales, and priority delivery. Premium users can unlock special features, such as personalized recommendations and loyalty rewards. This module helps improve customer engagement and retention.

### **7. AI-Powered Breed Identification & Management**

A key highlight of PAWHUB, this module uses advanced Convolutional Neural Networks (CNNs) to analyze uploaded dog images and predict their breed with high accuracy. It provides detailed breed insights, including characteristics, health information, and care tips. Pet shop owners and breeders can utilize this feature for better breed classification and inventory categorization.

## **CONCLUSION**

PAWHUB is a groundbreaking solution that bridges the gap between traditional pet shops and modern AI-driven e-commerce platforms. The pet industry has long relied on manual breed identification, outdated inventory systems, and inefficient sales processes, making it challenging for customers to find reliable breed information and access pet-related products seamlessly. By integrating artificial intelligence, PAWHUB ensures accurate and efficient breed identification, eliminating misinformation and allowing pet owners, breeders, and shop owners to make well-informed decisions. Additionally, the platform revolutionizes the pet shopping experience by offering a comprehensive digital marketplace where users can explore and purchase a wide range of pet products while benefiting from automated inventory tracking, secure transactions, and real-time order tracking.

One of the key innovations of PAWHUB is its role-based user management system, which enhances security and operational efficiency by providing structured access to administrators, suppliers, customers, and couriers. Unlike traditional pet shops, which rely on manual record-keeping and limited payment options, PAWHUB streamlines sales and logistics with an automated order management system and a hassle-free return policy, ensuring smooth transactions for all users. The integration of a Premium Membership Program further enhances user engagement by offering exclusive benefits such as discounts, early access to promotions, and personalized product recommendations, leading to improved customer satisfaction and loyalty.

By leveraging a robust technology stack, including Django for backend development, SQLite for data management, and an AI-powered Convolutional Neural Network (CNN) for breed identification, PAWHUB sets a new benchmark in the pet industry. This project is not only an innovative approach to modernizing pet shops but also an essential step toward a more transparent, efficient, and user-friendly pet commerce ecosystem. The expected impact of PAWHUB extends beyond simplifying pet purchases—it ensures accuracy in breed identification, optimizes inventory and logistics for businesses, and enhances the overall shopping experience for pet owners. As the global pet industry continues to grow, PAWHUB provides a future-ready solution that embraces artificial intelligence, automation, and digital commerce, making it a pioneering platform in the pet market.