IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 13, Issue 6, June 2026

DOI: 10.17148/IARJSET.2026.13627

Stray Buddies: Stray Animal Rescue and Shelter Connect

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Abstract: The increase in number of stray animals and the lack of an organized rescue system create significant challenges in urban areas. This paper presents Stray Buddies, a web-based platform designed to support stray animal rescue, symptom-based health prediction, veterinary assistance, and secure user management. The system allows users to report stray animals through a structured questionnaire and location details, enabling early identification of possible health conditions. Built using React, TypeScript, Node.js, Express.js, Supabase, and PostgreSQL, the platform provides secure authentication and real-time data management. By combining cloud technologies with intelligent symptom analysis, Stray Buddies aims to improve rescue coordination and promote animal welfare.

Keywords: Animal Rescue system, Disease Prediction, Symptom Analysis, Questionnaire Based Health Analysis, Web Platform

I. INTRODUCTION

The increasing number of stray animals in urban areas has become a significant concern. Stray animals often suffer from injuries, diseases, malnutrition, and accidents, while rescue efforts are frequently delayed due to the lack of a centralized communication and management system. Most rescue activities rely on social media posts, phone calls, or informal networks, making coordination between citizens, veterinarians, and rescue volunteers inefficient.

Recent advancements in web technologies and cloud-based systems provide opportunities to improve the management of animal rescue operations. Digital platforms can streamline communication, enable faster reporting, and support better decision-making during rescue activities.

This paper presents Stray Buddies, a web-based platform developed to support stray animal rescue, symptom-based health prediction, veterinary assistance, and adoption services. The system allows users to report stray animals by providing symptoms and location details through a structured questionnaire. Based on the submitted symptoms, the platform predicts possible health conditions and suggests appropriate actions or veterinary consultation.

To ensure security and reliability, the platform incorporates secure user authentication and profile verification mechanisms. Cloud-based infrastructure enables real-time data synchronization and efficient management of rescue requests.

The main objective of the proposed system is to create a centralized, scalable, and user-friendly platform that enhances rescue coordination, encourages community participation, and contributes to improved animal welfare through the use of modern web technologies.

II. LITERATURE REVIEW

Multiple studies have explored the application of new age technologies to improve animal healthcare. Symptom-based disease prediction systems have shown that structured questionnaires and rule-based analysis can assist in identifying possible health conditions and providing preliminary recommendations. Such systems help in the early detection of diseases and support timely intervention.

Researchers have also proposed GPS and IoT-based solutions for animal monitoring and rescue operations. These systems enable location tracking and movement analysis; however, they often require specialized hardware such as GPS collars or RFID devices, increasing implementation costs and limiting their suitability for large-scale stray animal management.

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In addition, various mobile and web applications have been developed for pet adoption, veterinary consultation, and animal care services. While these platforms offer useful features for pet owners, they generally provide limited support for stray animal rescue and lack centralized coordination among citizens, rescuers, and veterinary professionals.

Cloud-based technologies have further improved the development of scalable and real-time applications. Modern authentication mechanisms, including email-based login and OTP verification, have enhanced application security and user reliability. These technologies support efficient data management, secure access control, and seamless communication among users.

Despite these advancements, existing solutions often operate independently and do not provide a unified platform that combines rescue reporting, symptom-based health prediction, secure user verification, and real-time coordination. To address these limitations, the proposed Stray Buddies platform integrates these functionalities into a single cloud-based system, aiming to improve rescue efficiency, user engagement, and overall animal welfare.

III. PROPOSED SYSTEM/METHODOLOGY

The proposed system, Stray Buddies, is a web-based platform designed to improve stray animal rescue and welfare management through digital technologies. The system provides a centralized environment where users can report stray animals, access veterinary assistance, and participate in adoption activities.

The workflow begins with user registration and authentication. Users can create an account using either email-password credentials or phone number OTP verification. After successful authentication, users are required to complete their profile information to ensure reliable communication and user verification.

Once registered, users can report a stray animal or check their pet's health by observed symptoms through a structured questionnaire. The symptom data is analysed using a predefined rule-based mechanism to predict possible health conditions. Based on the prediction results, the system suggests appropriate actions and recommends veterinary consultation when required.

The platform also supports rescue coordination by storing and managing rescue requests in a centralized cloud database. Real-time synchronization enables quick access to updated information, allowing users and administrators to track rescue activities efficiently.

For adoption support, users can view and share information about animals available for adoption, encouraging community participation in animal welfare initiatives.

The system is developed using React and TypeScript for the frontend interface, while Node.js and Express.js are used for backend services and API management. Supabase and PostgreSQL provide authentication, cloud storage, and database management functionalities.

By integrating secure authentication, symptom-based health prediction, rescue reporting, and cloud-based data management, the proposed system offers a scalable and user-friendly solution for improving stray animal rescue operations and welfare services.

IV. TECHNOLOGIES USED

A. React and TypeScript

React and TypeScript are used for developing the frontend of the application. They provide a responsive and interactive user interface to the users. Also improving code maintainability and reliability.

B. Node.js and Express.js

Node.js serves as the backend runtime environment, and Express.js is used to develop RESTful APIs. These technologies handle server-side processing and enable communication between the frontend and database.

C. Custom API Services

The system utilizes custom APIs to manage user authentication, rescue reports, veterinary information, and data exchange between different modules. These APIs ensure seamless integration and efficient data processing.

D. Supabase and PostgreSQL

Supabase is used as the Backend-as-a-Service (BaaS) platform, providing authentication, cloud storage, and real-time synchronization. PostgreSQL serves as the relational database for storing user information, rescue reports, symptom records, and adoption details.

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E. OpenAPI and Large Language Models

The symptom-based disease prediction module is implemented using OpenAPI-based Large Language Models (LLMs). User symptoms collected through a structured questionnaire are analyzed by the LLM to predict possible health conditions and suggest appropriate actions or veterinary consultation. This approach enables intelligent and flexible health assessment without requiring dedicated machine learning models.

F. Authentication System

The platform incorporates secure authentication through email-password login and phone number OTP verification. These mechanisms enhance user security and ensure reliable access to the system.

All these technologies combined results in a centralized and user-friendly platform that improves rescue coordination, facilitates intelligent symptom-based health prediction, and promotes community participation in animal welfare.

V. SYSTEM DESIGN

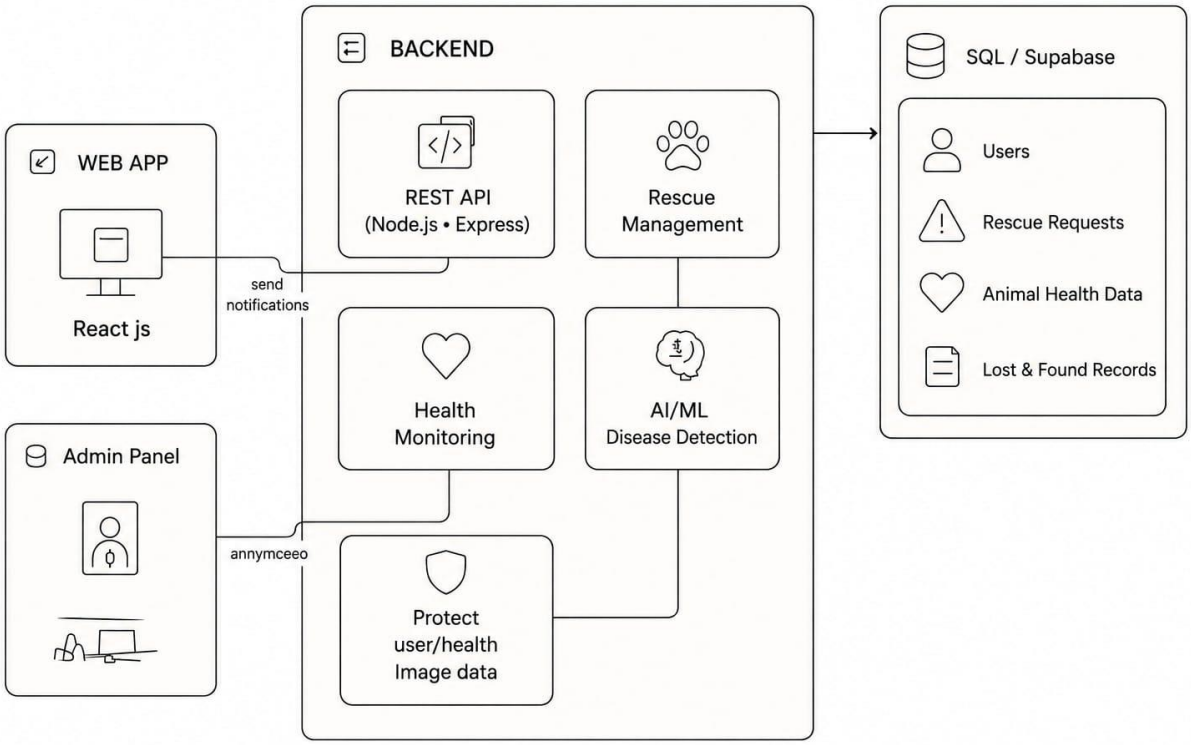

Fig. 1 System Design

The architecture of the proposed Stray Buddies platform follows a modular design consisting of a web application, backend services, administrative interface, and a centralized database. The overall structure is designed to ensure efficient communication between users, administrators, and system components.

The web application, developed using React.js, acts as the primary interface through which users can access various services such as reporting stray animals, viewing rescue requests, and obtaining health-related information. An admin panel is provided to manage users, monitor rescue activities, and oversee system operations.

The backend is implemented using Node.js and Express.js, which expose REST APIs to process user requests and coordinate interactions between different modules. The rescue management module handles rescue-related operations, while the health monitoring component maintains records associated with animal health and symptoms.

For disease prediction, the system incorporates an intelligent analysis module based on OpenAPI-supported Large Language Models (LLMs). Information collected from symptom questionnaires is processed to identify possible health conditions and recommend appropriate actions or veterinary assistance.

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To ensure privacy and security, a dedicated protection layer is included to safeguard user information and health-related data. All application data, including user profiles, rescue requests, animal health records, and lost-and-found information, are stored in a centralized PostgreSQL database managed through Supabase. This cloud-based architecture supports real-time synchronization and enables efficient access to information across different modules.

The modular design improves scalability, simplifies maintenance, and provides a reliable platform for effective stray animal rescue and welfare management.

VI. OUTPUT SCREENS

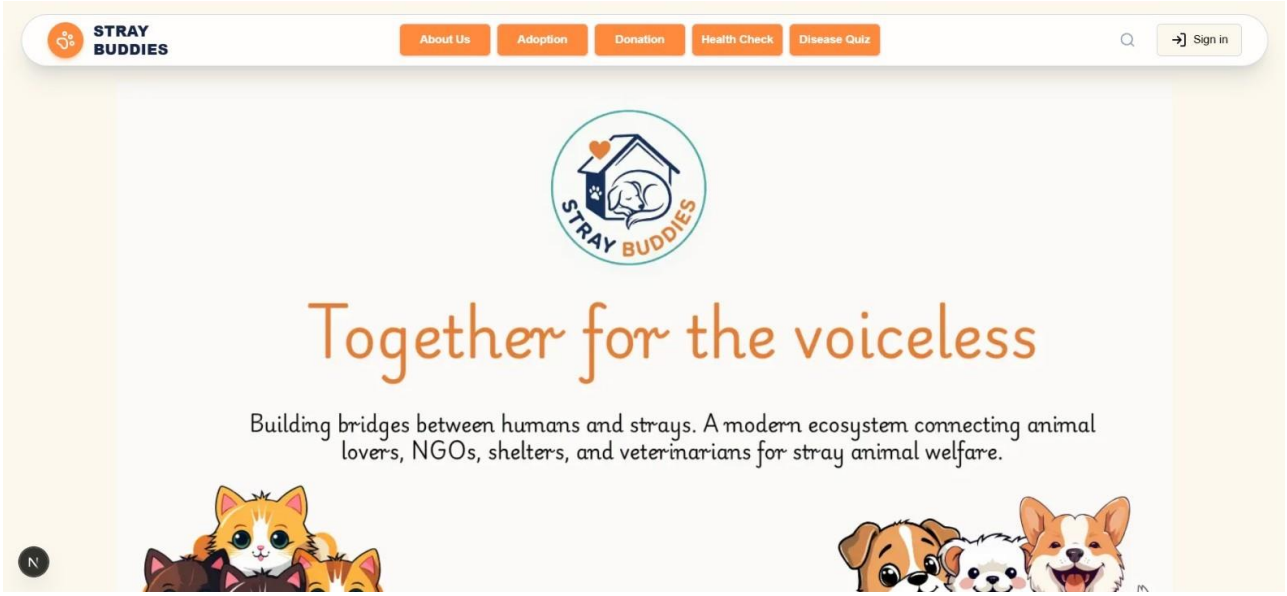

Fig. 2 Homepage

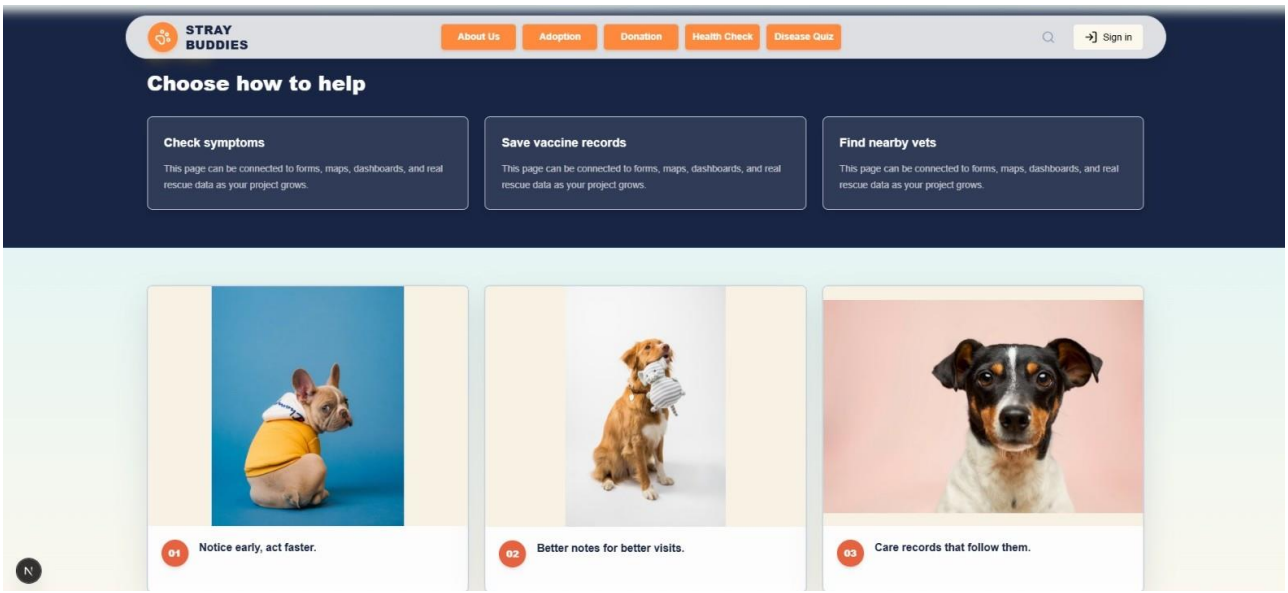

Fig. 3 Help Page

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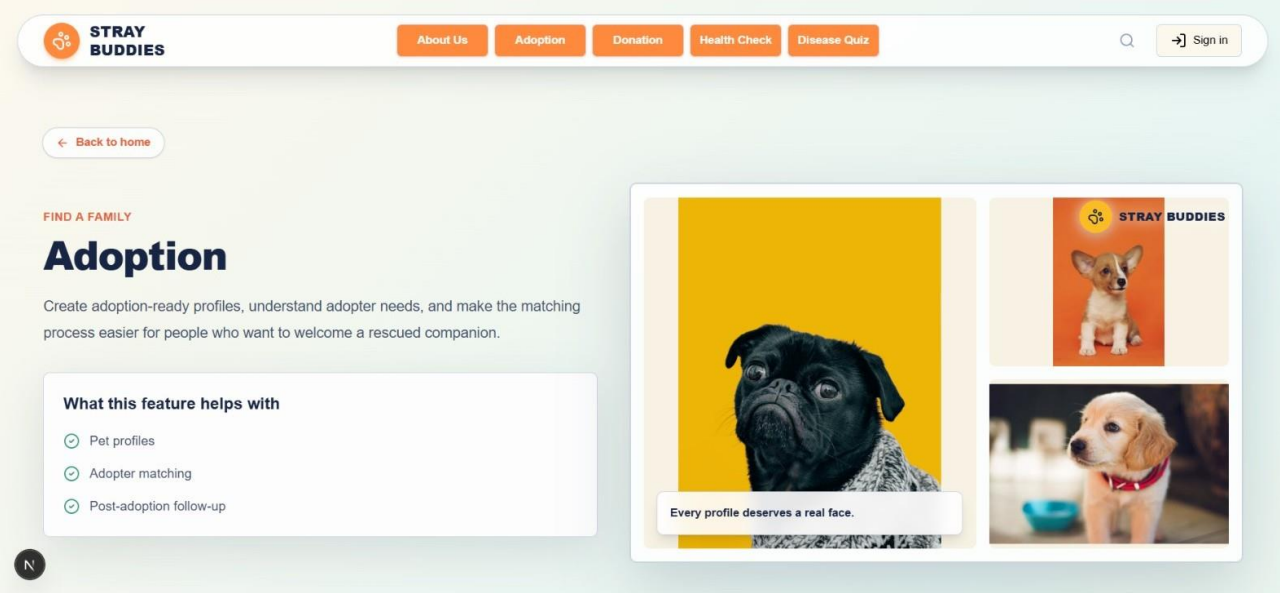

Fig. 4 Adoption Page

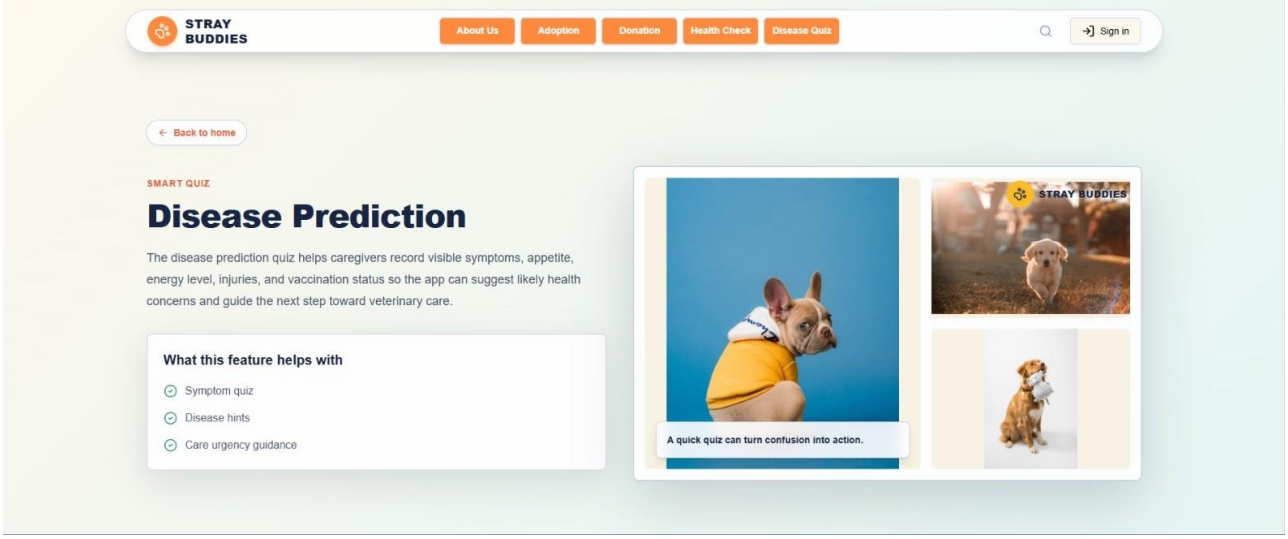

Fig. 5 Disease Prediction page

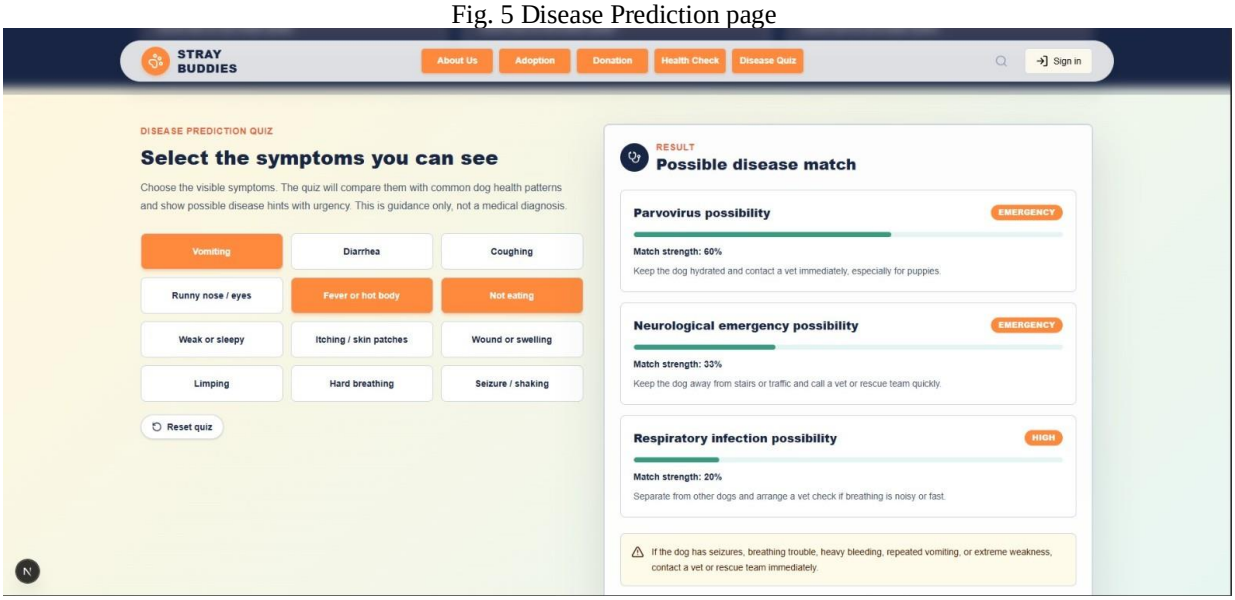

Fig. 6 Disease Prediction Quiz and Predictions

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VII. RESULT AND DISCUSSION

The proposed Stray Buddies platform was successfully developed and tested as a web-based application for stray animal rescue and welfare management. The system integrates multiple functionalities, including secure user authentication, rescue request management, symptom-based disease prediction, and administrative monitoring within a single platform.

Users are able to register securely and submit rescue requests by providing information about the animal and its observed symptoms. The backend APIs process the requests and store the information in a centralized database, allowing efficient management of rescue cases. The symptom-based health prediction module analyzes the input provided by users and generates possible health conditions along with suitable recommendations. This helps in providing preliminary guidance before professional veterinary assistance is obtained.

The administrative panel enables monitoring of user activities and rescue requests, improving overall coordination and management. Real-time data synchronization through Supabase ensures that updates are reflected immediately across the platform.

The developed system demonstrates that the integration of cloud technologies and intelligent language models can simplify rescue operations and improve access to animal healthcare information. The modular architecture also provides flexibility for future enhancements and expansion. Overall, the proposed solution offers an efficient and user-friendly approach for supporting stray animal welfare and encouraging community participation in rescue activities.

VIII. CONCLUSION

In this paper, a web-based platform named Stray Buddies has been proposed and developed to support stray animal rescue and welfare activities. The system brings together rescue management, symptom-based disease prediction, secure user authentication, and centralized data management within a single platform. By utilizing modern web technologies and OpenAPI-based Large Language Models, the proposed solution provides users with preliminary health assessments and facilitates timely rescue operations.

The integration of cloud-based services enables efficient storage and real-time access to rescue information, while the modular architecture ensures scalability and ease of maintenance. The developed platform encourages community participation and provides a structured approach to managing rescue requests and animal health records.

Overall, Stray Buddies demonstrates how intelligent technologies can be applied to address real-world challenges in animal welfare. The system offers a practical, secure, and user-friendly solution that has the potential to improve rescue coordination and contribute to the well-being of stray animals. Future enhancements may include support for additional animal species, improved prediction capabilities, and integration with veterinary organizations and rescue agencies on a larger scale.

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