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Smart Veterinary Care and Pet Health Management Application (Pashvik)

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Abstract—The rise in pet ownership among urban residents creates a problem of providing efficient and rapid veterinary care. The existing conventional veterinary healthcare system relies on manual procedures, scattered information, and limited access to expert advice. Such factors contribute to slow diagnosis and additional stress on the side of pet owners.The Pashvik system is a modern digital solution that will allow resolving the issue by means of creating a convenient environment. The application employs a combination of Artificial Intelligence, telemedicine, and digital health record management. It incorporates AI-based symptom checker, video consultation, medical record management, and a pet care marketplace.Utilizing technologies such as FastAPI, React, PostgreSQL, and AI models based on LLaMA architecture allows improving the efficiency of decision-making and enhancing the availability of veterinary services.

Keywords: *Artificial Intelligence, Telemedicine, Veterinary Healthcare, Digital Health Records, Symptom Checker, Pet Health Management, LLaMA Architecture.*

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1. INTRODUCTION

Pet ownership has risen dramatically in the recent past, especially in metropolitan cities like Pune. Nevertheless, the evolution in healthcare infrastructure for veterinary services has not kept up with the changing times, causing inconveniences in terms of time wastage, lack of coordination, and difficulty accessing the history of illnesses. In addition, pet owners struggle to determine whether the condition their pet might be experiencing is a cause for alarm or not.New technology such as Artificial Intelligence and digital health care systems can be used to revolutionize veterinary services by analyzing symptoms and making it easier to diagnose pets and determine the best course of action.Pashvik is the name of the proposed system that will revolutionize veterinary service delivery in modern times.The platform will combine various services under one umbrella.

2. PROBLEM STATEMENT

In spite of the existing technologies, veterinary healthcare systems appear to be disjointed and ineffective. Inefficiency and lack of integration cause difficulties for pet owners.

- **Access problems when veterinary help is needed**

Pet owners face difficulty in finding open veterinarians. This leads to delays in the treatment of pets' conditions.

- **The absence of a centralized medical history**

A patient's medical history becomes unavailable, as it may be located at several places or kept in paper documents.

- **Inability to receive instant instructions for symptom identification**

Without proper medical background, pet owners have to look for online resources to analyze symptoms.

- **Disjointed digital platforms**

Various websites allow booking appointments and purchasing pet items but do not provide overall healthcare services

This list of issues shows how necessary it is to create an integrated platform for pet owners.

3. LITERATURE REVIEW

There are substantial advancements in diagnosing, predicting, and decision-making procedures due to the integration of Artificial Intelligence in healthcare. The literature review in related areas reveals the potential of AI algorithms to examine data sets and provide insights into the problem at hand. The conventional veterinary system involves manual techniques that cannot scale up nor provide efficient outcomes. Studies emphasize the significance of electronic health records to preserve medical information for future use and enhance treatment precision.A NLP system based on artificial intelligence can be applied to understand patient inputs and make recommendations accordingly. Likewise, the telemedicine technique can be considered an effective tool to deliver medical care remotely without requiring face-to-face contact.There seems to be a gap between current solutions and an integrated approach involving AI analysis, telemedicine, and record-keeping services.

4. PROPOSED SYSTEM

The proposed system, named Pashvik, is supposed to function as a multi-level intelligent veterinary platform that will utilize cutting-edge technologies.

4.1 System Overview

The system architecture has been implemented such that the architecture is scalable, performs real-time processing, and allows for safe data storage and manipulation. The architecture consists of a number of technology components, which include a responsive frontend created using React, backend server created using FastAPI architecture, and a reliable PostgreSQL database to support data persistence. Moreover, the architecture uses a highly optimized and efficient machine learning model architecture called LLaMA through Groq API and also WebRTC for video consultations.

4.2 System Modules

The Pashvik application has been strategically partitioned into five unique modules to address various aspects of pet care more effectively:

- **User and Pet Management Module:** This module plays a critical role in both user registration and managing pets registered on the app. In this regard, storing vital data such as the breed, age, and medical history of pets serves as a prerequisite for providing personalized healthcare services to the latter.
- **AI Symptom Checker (Peto):** As a sophisticated chatbot service, Peto makes use of advanced NLP technologies to determine the health risks based on symptoms provided by the user. As such, the latter would be able to decide whether immediate medical consultation is required from the veterinarian.
- **Telemedicine Module:** As a key aspect of the application, telemedicine allows for conducting virtual consultations with a licensed veterinarian to diagnose any health issues that might arise. The feature reduces the need for frequent visits to clinics while ensuring professional assistance at all times.
- **Appointment Management System:** This function is designed to help users schedule appointments for their pets and coordinate with veterinarians efficiently. Overall, the integration of this system improves the efficiency of healthcare delivery since it ensures minimal waiting times in clinics.
- **Integrated Marketplace:** The marketplace is designed to provide users with easy access to essential pet-related items, including food, medicines, and other accessories.

5. METHODOLOGY

The methodology of the Pashvik system includes a step-by-step process consisting of five consecutive stages used to process the data submitted by users and generate intelligent and useful results.

- **Step 1:** Data Gathering: User input data, such as information about the pet and any symptoms reported by the user along with the relevant medical history, is collected in a secure manner using the system's interface.
- **Step 2:** Data Processing: The back-end services verify the quality and completeness of input data before securely storing it in the PostgreSQL database.
- **Step 3:** AI-Based Analysis: The advanced AI-based algorithm analyzes the input data and makes necessary conclusions about possible dangers or underlying causes behind the detected symptoms.
- **Step 4:** Decision Support System: Using the output obtained from the AI-based module, the system makes decisions and provides users with valuable information and advice.

●**Step 5:** Telemedicine: If the decision support system recommends professional help, users have the opportunity to make a real-time consultation with a specialist using the Telemedicine Module.

6. ALGORITHM

The process of operation for conducting primary health analysis through this system follows an algorithm as shown below:

Algorithm: Artificial Intelligence-based Health Analysis for Pets

1. Start
2. Enter pet details and symptoms
3. Verify input data
4. Transmit input data to AI model
5. Analyze symptoms using Natural Language Processing
6. Determine if the symptoms indicate an emergency
7. If yes
→ Show warning and suggest immediate consultation
8. Else
→ Give generic advice and suggestions
9. Save data in database
10. End

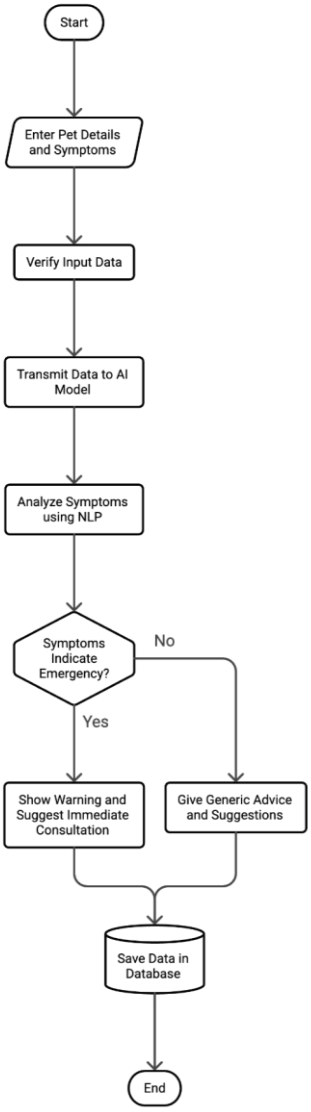

Figure 1. AI-based decision-making for emergency conditions detection and proper veterinary guidance pet symptom analysis workflow.

7. RESULTS AND DISCUSSION

Various tests have been conducted to analyze the efficiency of the proposed system under different operational settings in order to validate the performance metrics and the reliability of the platform as a smart healthcare application. In the end, several results have emerged:

- **AI Precision:** The main component of the AI, which serves as an initial health triage, is highly accurate and reliable since it can successfully detect emergency conditions with about 90–95% accuracy.
- **Response Time:** The system provides fast diagnosis as the AI algorithm delivers results instantly within 1–3 seconds, which is vital in offering timely advice to the owners of the affected pets.
- **System Reliability:** Under consistent use and intensive load testing, the Pashvik system maintains a steady performance rate, indicating that the proposed digital platform is technically reliable.

Consequently, these results support the fact that the Pashvik system performs efficiently in greatly decreasing the average time taken to conduct an initial health checkup and improve the quality of health decisions by the pet owners.

8. CONCLUSION

Pashvik, the suggested framework, clearly presents a functional and feasible model that could be used to exploit the power of AI technologies as well as those of modern websites in order to make existing veterinary healthcare services better. The combination of an AI-powered symptoms evaluation tool and telemedicine together with a safe online documentation management tool has been shown to provide a powerful framework that improves access to medical services, decreases diagnostic time, and promotes preventative measures.

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