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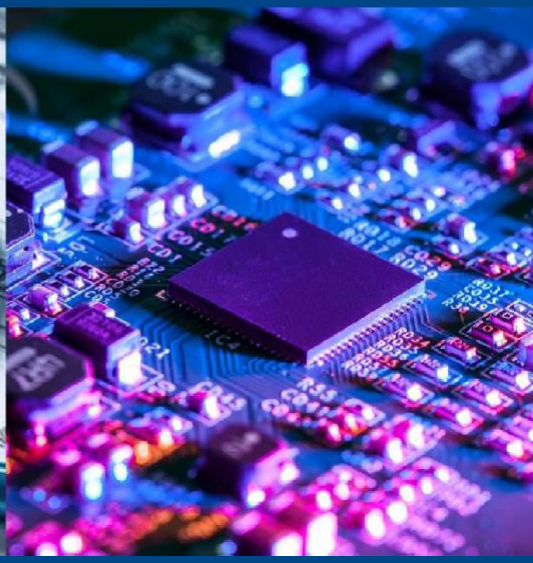

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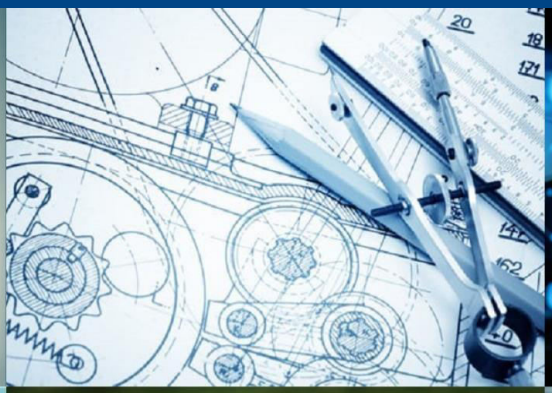

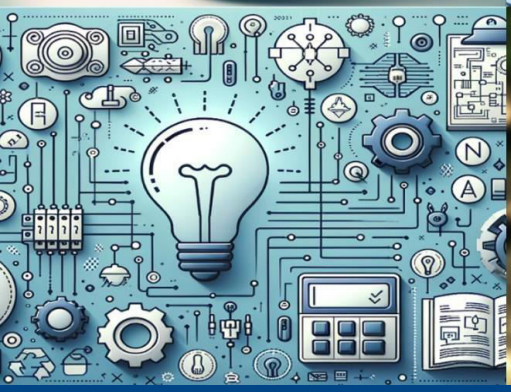

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VetNova: AI-Enabled Pet Health Monitoring, Product and Virtual Veterinary Services

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ABSTRACT: VetNova is an AI-enabled pet care platform developed to simplify and streamline pet health monitoring, product management, & virtual veterinary services. The application addresses the challenge of fragmented pet healthcare by offering, & a unified solution that allows owners to track health, consult veterinarians, and purchase pet products within a single interface. Built with React.js for the frontend, Node.js for the backend, and MongoDB for secure data storage, the system integrates intelligent health analysis that evaluates pet details to provide actionable suggestions. It focuses on health monitoring, virtual consultations, product purchasing, & order management. At its core, the system leverages AI-driven health assessments, processing details such as breed, age, and symptoms to deliver concise, relevant health Users benefit from secure authentication, a dynamic dashboard, city-based hospital locators, product browsing with cart and checkout features, and consolidated order tracking through a responsive interface for both desktop and mobile use.

KEYWORDS: Pet Health, AI Integration, Veterinary Services, React.js, Node.js, MongoDB, Generative AI

I. INTRODUCTION

VetNova introduces a modern approach to pet healthcare management, enabling owners to monitor & maintain their pet's well-being through a unified digital platform. Leveraging advancements in web technologies & intelligent analysis, the system combines secure authentication, responsive design, & AI-based health evaluation to deliver timely and actionable insights. The workflow begins with a structured signup and login process, ensuring that only authenticated users can access personalized dashboards, book consultations, & place product orders. By centralizing services like health monitoring, consultation booking, & product ordering, the platform enhances convenience, promotes proactive care, & ensures that essential veterinary services are accessible from anywhere, anytime.

II. LITERATURE SYRVEY

[1] AI in Veterinary Healthcare – AI-enabled systems in veterinary care have shown promising results in assisting diagnosis & treatment recommendations. Research by Johnson et al. (2018) demonstrated that rule-based AI models could evaluate pet health data, & offering relevant advice to pet owners. While effective for basic analysis, these systems lacked integration with other essential pet care services, limiting their practical adoption.AI Approaches, procedures have fundamentally progressed signal acknowledgment frameworks. Johnson and Brown (2017) executed a Help Vector.

[2] Web-Based Pet Care Platforms – Traditional pet care portals often focus on singular services like appointment booking or online product sales. A study by Lee and Kim (2019) presented a web-based veterinary appointment system that improved clinic visit efficiency but offered no health prediction or multi-service integration. This gap highlighted the need for comprehensive, unified solutions.

[3] E-commerce and Health Monitoring Integration – Combining e-commerce with healthcare management has been explored in human healthcare but is less common in veterinary contexts. Sharma et al. (2020) developed a prototype for an integrated health & product management platform for livestock owners. While it improved convenience, it lacked AI-based analysis, & reducing its potential for proactive health management.

[4] AI-Driven recommendation Systems – Recommendation engines have been widely studied for their ability to personalize user experiences. Research by Patel and Singh (2021) applied AI to suggest pet food and care routines based on breed and age, resulting in improved engagement. However, their approach was limited to product recommendations & did not extend to health consultations or medical advice.

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[5] Integration of Mapping and Location Services – Location-based systems have been applied in healthcare to connect users with nearby facilities. According to Kumar et al. (2022), integrating mapping APIs in medical platforms improved access to healthcare by enabling users to locate service providers quickly. Despite these benefits, such systems rarely extend to veterinary care, leaving an opportunity for combined health monitoring and location services in a single platform.

EXISTING SYSTEM

Existing pet care solutions are often fragmented, focusing on specific functions such as online appointment booking, product sales, or basic health information. Many platforms require users to navigate multiple websites or applications to access different services, leading to a disjointed experience. AI-based veterinary systems that exist today are typically limited to static symptom checkers, offering generic results without considering breed-specific or age-specific factors. E-commerce-based pet portals, while efficient for product purchases, lack integrated health monitoring & consultation features. Additionally, current systems rarely enforce secure login and structured signup workflows, allowing unverified access that may compromise personalization & data security. The absence of a unified, AI-driven approach that combines health analysis, virtual consultations, product purchasing, & location-based veterinary service discovery limits the effectiveness of these solutions in delivering comprehensive pet care.

PROPOSED SYSTEM

The proposed system, *VetNova*, is an AI-enabled platform designed to unify pet healthcare, product management, and virtual veterinary services within a single application. The platform begins with a secure signup & login process to ensure only authenticated users can access personalized services. Once logged in, users are presented with a dynamic dashboard offering modules for pet health monitoring, virtual consultations, product purchasing, and order management.

The AI-driven health assessment module processes pet details such as breed, age, and symptoms to generate concise, relevant suggestions. The consultation booking workflow includes a validated form for owner and pet details, illness description, and payment. The product store allows browsing of pet-related items, with add-to-cart, remove, and order confirmation features. A location-based hospital discovery service enables users to search veterinary facilities by city.
The backend, developed in Node.js with MongoDB, ensures secure data management, while the React.js frontend provides a responsive interface.

III. SYSTEM ARCHITECTURE

A system comprises an organized collection of independent components interconnected in accordance with a predetermined plan to accomplish a particular goal. Its key attributes include organization, interaction among components, independence, integration, & a central objective guiding its operation.

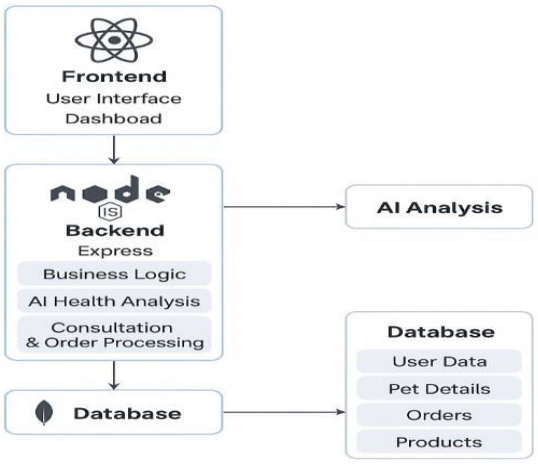

Fig 3.1 System Architecture

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IV. METHODOLOGY

The methodology for developing VetNova, an AI-enabled pet care platform, follows a structured approach integrating user-focused web application design, backend processing, and intelligent health analysis for personalized veterinary recommendations.

A. Requirement Analysis:

The initial stage involved identifying gaps in existing pet care solutions, particularly the lack of integrated platforms offering health monitoring, consultations, and product management. User expectations, common pet health issues, and accessibility needs were studied to design a system capable of delivering four major services: health monitoring, virtual consultations, product purchasing, and order management.

B. System Architecture Design:

- Frontend (Client Layer) – Developed using React.js, providing a responsive and intuitive interface accessible on both desktop and mobile devices.
- Backend (Server Layer) – Built on Node.js with Express, handling business logic, secure authentication, and communication with the database.
- AI Health Analysis Module – Processes pet details such as breed, age, and symptoms to generate relevant, concise health suggestions for proactive care.
- Database Layer – Managed with MongoDB, securely storing user profiles, pet records, consultation details, products, and orders.

V. DESIGN AND IMPLEMENTATION

VetNova, an AI-enabled pet care platform, involves several key steps and considerations. In terms of design, the system follows a three-tier architecture comprising the frontend, backend, & database layers. The frontend is developed using React.js, providing a responsive & intuitive interface for both desktop and mobile devices. Key interface modules include user authentication, dashboard display, consultation booking, pet profile management, product browsing, cart handling, & AI-based health analysis. Each module is designed with form validations to ensure that required fields are completed before submission. The backend is implemented using Node.js with Express, handling secure authentication, business logic, & data processing. MongoDB is used for the database layer, storing structured collections for user accounts, pet details, consultations, products, and orders, with relationships that maintain data integrity. A critical feature is the AI health analysis module, which processes user-provided pet details such as breed, age, and symptoms to generate concise health suggestions. The AI module is seamlessly integrated into the platform so that results are displayed in real time after submission.

The implementation process begins with developing the authentication & dashboard modules, followed by integrating consultation booking & product management features. The AI analysis feature is added next, along with the city-based hospital locator. Finally, all modules are tested extensively for validation handling, performance, & user experience across different devices and network conditions. The completed system allows users to register, log in, manage pet profiles, receive AI-generated health feedback, consult veterinarians, purchase pet products, & track orders, all through a unified and accessible platform.

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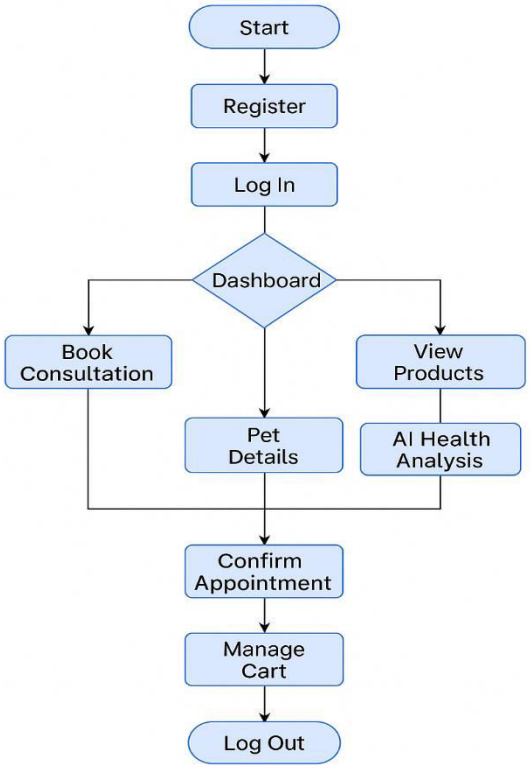

Fig 5.1 Flowchart of Working System

VI. .OUTCOME OF RESEARCH

The *VetNova* platform successfully integrates essential pet care functionalities within a unified, AI-enabled environment. It demonstrates strong capabilities in accurately processing pet health data and delivering concise, & relevant health suggestions to users. Comprehensive testing confirmed the system's reliability in handling secure authentication, managing consultations, & processing orders without errors. The AI health analysis consistently produced actionable insights, & enhancing the decision-making process for pet owners.

VII. RESULT AND DISCUSSION

Health Monitoring Accuracy: The platform effectively collects & processes pet details such as breed, age, and symptoms, delivering precise AI-generated health suggestions. These insights have proven to be relevant & actionable, & assisting owners in identifying potential health concerns early and enabling proactive care.

Integrated Service Access: By combining health monitoring, virtual consultations, and product purchasing in one platform, VetNova offers users a unified and intuitive environment. This eliminates the need for multiple applications, & improving user convenience and engagement.

User Experience and Accessibility: Feedback from testing indicates that the platform provides a smooth & responsive interface, with clear navigation between modules such as consultations, pet product browsing, & order management. Secure authentication ensures that personal & pet data remain protected while maintaining ease of access.

Scalability and Adaptability: The system demonstrates flexibility in handling multiple users, & varied product inventories, & city-based hospital listings.

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Potential Enhancements: While the platform meets its core objectives, further improvements could include expanding the AI's health analysis to support more breeds and conditions, enhancing the consultation module with real-time video sessions, and introducing multilingual support to reach a broader audience.

Reliability: Testing under varied internet conditions confirmed that the system maintains stable performance for both desktop and mobile access, ensuring accessibility even in low-bandwidth scenarios.

VIII. CONCLUSION

VetNova successfully demonstrates the potential of integrating artificial intelligence with modern web technologies to address the challenges in pet healthcare management. By unifying health monitoring, virtual consultations, and product purchasing into a single platform, the system enhances convenience, accessibility, & proactive pet care for owners. The AI-driven health analysis provides timely and relevant suggestions, enabling users to make informed decisions without delay. With its secure authentication, responsive design, & scalable architecture, VetNova can adapt to evolving user needs & service expansions. The system not only streamlines routine veterinary processes but also paves the way for future advancements such as IoT-based real-time health tracking & multilingual support, making it a robust & future-ready solution for pet care.

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