

Abstract

The Pawfect Diet app addresses the gap in canine nutrition management by leveraging AI for personalised, breed-specific dietary recommendations. The app features AI-generated daily logs, an interactive Vet Care chat, and calorie tracking. Usability testing with 22 participants showed high satisfaction with personalised diet plans and calorie tracking, highlighting AI's potential in dietary management for dogs. Despite initial limitations the app shows promise in advancing AI-driven pet care. Future improvements will refine AI models, expand the breed database, and enhance user features.

Introduction

Managing canine nutrition effectively remains a significant challenge for many dog owners who often rely on non-veterinary sources for dietary guidance (Wainwright *et al.*, 2022). These sources can be inconsistent and lack the scientific basis required to ensure optimal health for dogs. Poor dietary management can lead to various health issues, including obesity, malnutrition, and related complications (K. Kazimierska and W. Biel, 2020; A. Hoummady *et al.*, 2022). Recognising this gap, the Pawfect Diet app was developed to provide dog owners with accurate and personalised dietary advice using advanced Artificial Intelligence (AI) technologies. The app aims to offer a tailored approach to canine nutrition, considering factors such as breed, age, weight, and activity level (A. Gautam *et al.*, 2018). By leveraging AI, Pawfect Diet generates daily meal plans and tracks calorie intake to meet the specific health needs of each dog. This project not only addresses the technical aspects of app development but also emphasises user experience, incorporating feedback from dog owners and veterinarians to refine the app's features and functionalities. The dissertation presents the comprehensive development process of the Pawfect Diet app, detailing its methodology, key features, and the significant impact on improving canine nutrition management. It highlights the integration of AI technologies, the iterative design and testing methodology, and the positive outcomes observed from user feedback and usability testing.

Aim and Objectives

Aim

To develop an AI-driven mobile application that offers personalised dietary plans, tracks calorie intake, and provides nutritional advice tailored to individual dogs' needs.

Objectives

- Literature Review:** Analyse current canine nutrition science and AI applications.
- Surveys:** Understand dog owners' and veterinarians' needs and preferences.
- Design:** Create a user-friendly interface.
- Development:** Implement AI technologies for precise dietary recommendations.
- Testing:** Validate the app through usability testing and user feedback.

References

A. Hoummady *et al.* (2022). *Comparison of canine owner profile according to food choice: an online preliminary survey in France. BMC Vet Res*, 18(163). doi:https://doi.org/10.1186/s12917-022-03258-9

J. Wainwright *et al.* (2022, January 2022). *Owners’ views of canine nutrition, weight status and wellbeing and their implications for the veterinary consultation. Journal of Small Animal Practice*, 63(5), 381-388. doi:https://doi.org/10.1111/jsap.13469

K. Kazimierska and W. Biel. (2020). *FEEDING OF SPORTING DOGS. Department of Monogastric Animal Sciences, Division*, 355(54), 5-14. doi:10.21005/AAPZ2020.54.2.01

A. Gautam *et al.* (2018, April 10). *Scientific dog feeding for good health and its preparation: A review. Journal of Entology and Zoology Studies*, 2(6), 1683-1689. https://www.entomoljournal.com/archives/2018/vol6is sue3/PartW/6-3-264-791.pdf

Methodology

Research Design

- Mixed-Methods Approach:** This project utilised a mixed-methods approach, combining qualitative and quantitative data from surveys of dog owners and veterinarians. This approach ensured a comprehensive understanding of the current practices, challenges, and preferences in canine nutrition management. Qualitative data provided in-depth insights into user experiences and expectations, while quantitative data allowed for statistical analysis and generalisation of findings.
- Agile Iterative Development:** The development process followed an Agile iterative methodology, which involved continuous feedback and improvement cycles. This approach enabled the integration of user feedback at various stages of development, ensuring that the app evolved to meet user needs effectively. Regular iterations and testing allowed for the refinement of features, improving the app's functionality and user experience.

Data Collection

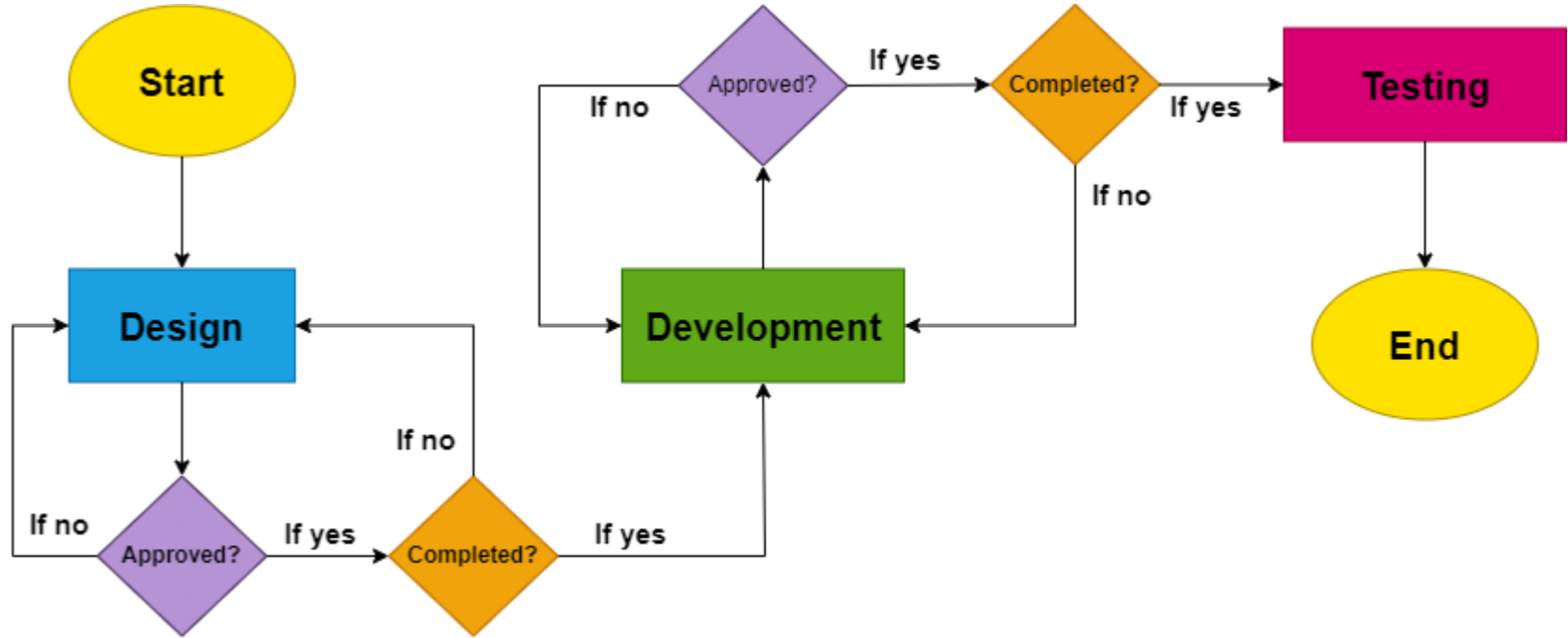
- Dog Owners Survey:** Gather insights on current practices and challenges in canine diet management.
- Veterinarians Survey:** Obtain expert opinions on common dietary issues and AI's potential role.

Development Tools

- Figma:** For designing UI/UX.
- React Native:** Cross-platform mobile app development.
- Firebase:** Backend services and database solutions.
- GPT-3.5 Turbo & TensorFlow:** For AI functionalities.

Testing

- Usability Testing:** Evaluating app effectiveness with 22 participants.
- Surveys and Feedback:** Iterative refinement based on user inputs.

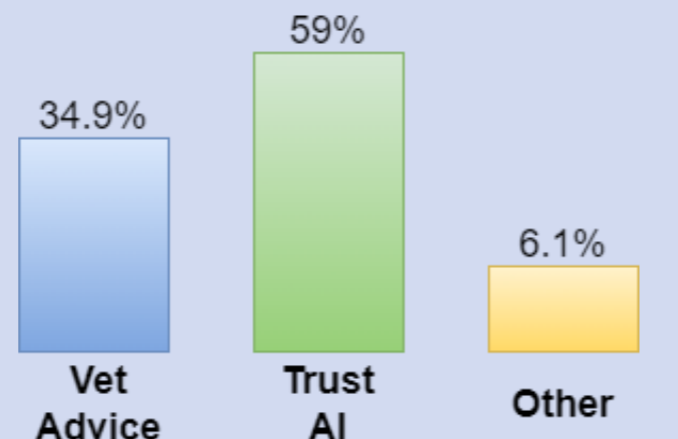


Result

Survey Insights

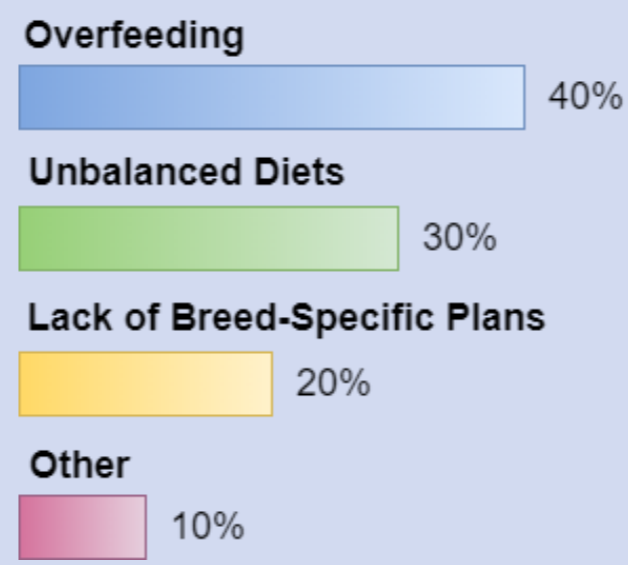
Reliance on Expert Advice

34.9% of dog owners rely on veterinarian advice for their dogs’ nutrition. This highlights the trust placed in professional guidance. Meanwhile, 59% of dog owners trust AI-driven dietary recommendations, showing a growing acceptance of technology in pet care.



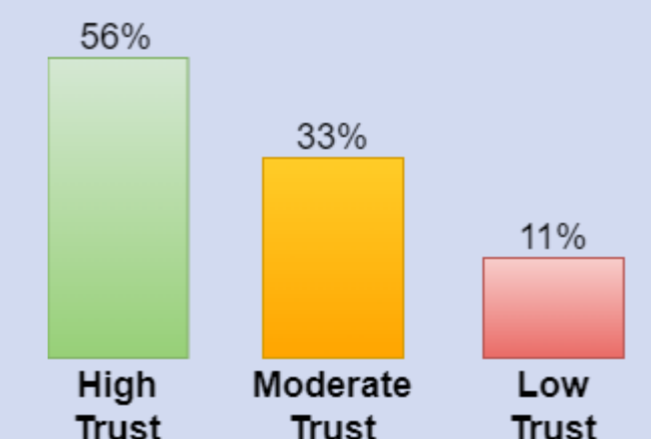
Common Dietary Issues

Both dog owners and veterinarians identified overfeeding and unbalanced diets as prevalent issues. Veterinarians particularly emphasised the need for breed-specific dietary plans to ensure optimal nutrition.



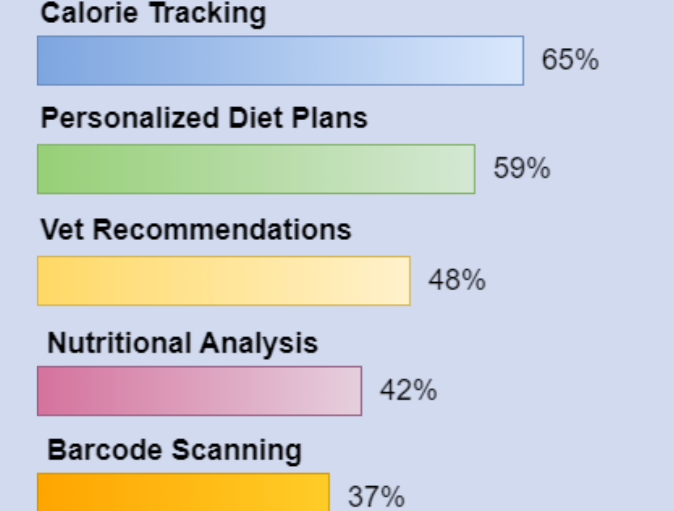
Trust in AI

Dog owners generally express a higher level of trust in AI recommendations. Veterinarians are cautiously optimistic, emphasising the need for accuracy. Combined, these perspectives provide a nuanced view of trust in AI for canine dietary management.



Desired Features

Both dog owners and veterinarians highlighted the importance of calorie tracking, personalised diet plans and professional advice integration. Additionally, users appreciated AI-generated diets but also valued manual adjustment options.



Usability Testing Result

Overall Satisfaction

The majority of participants are satisfied with Pawfect Diet. They appreciated the calorie tracking system, AI diet generator, AI feedbacks, AI interactions with vet care chat, and the detection system within the chat.

Ease of Use

Every participant found the app easy to use, underscoring the effectiveness of the app’s intuitive design and user-friendly interface.

Trust in AI

Participants had mixed feelings about the AI-generated recommendations. While many found the AI-generated daily log and Vet Care chat feature useful and trustworthy, some were neutral or hesitant, indicating areas for potential improvement in AI accuracy and reliability.

Pawfect Diet Preview

AI-Generated Meal Plan



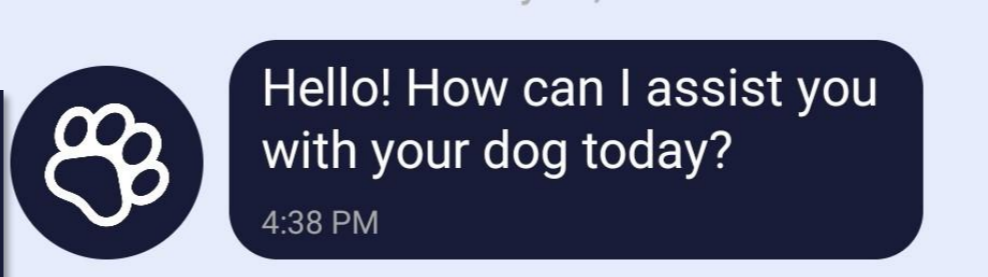
Calorie Tracker



Daily Feedback By AI



AI-Simulated Vet Consultation



Breed Recognition

Jack Russell Terrier	58.45%
Beagle	41.32%
Chihuahua	0.17%

Discussion

The Pawfect Diet app successfully integrates AI to provide personalised dietary recommendations and effective calorie tracking, which users found highly satisfactory. The app’s intuitive design ensured ease of use for all participants. However, trust in AI-generated recommendations was mixed, suggesting the need for enhanced AI accuracy and reliability. The iterative agile development process, supported by user feedback, effectively addressed initial integration challenges, refining both AI functionalities and the user interface. While the app was well-received, future improvements should focus on expanding breed-specific features, refining AI algorithms for better accuracy, and integrating a comprehensive food database. Additionally, incorporating more user control options will further increase user trust and satisfaction, ensuring the app continues to meet the needs of dog owners for effective canine dietary management and overall better pet health outcomes.