IT4010 – Research Project - 2024

Topic Assessment Form

Project ID:

1. Topic (12 words max)

AI-Driven Solutions for Comprehensive Canine Healthcare

2. Research group the project belongs to

Computing for Inclusive and Equitable Society (CIEC)

3. Research area the project belongs to

ICT for Development (ICTD)

4. If a continuation of a previous project:

Project ID	
Year	

5. Brief description of the research problem including references (200 – 500 words max) – references not included in word count.

Given the growing population of pet owners worldwide, it is crucial to prioritize the health and welfare of dogs. Conventional veterinarian services, although efficient, can encounter obstacles such as restricted availability, exorbitant expenses, and time limitations. Artificial intelligence (AI)powered technologies have the capacity to transform canine healthcare by offering individualized, effective, and prompt treatment. The primary objective of this study is to create asophisticated AI-based system that combines virtual veterinarian consultations, nutrition management, exercise planning, and skin disease detection in order to improve the quality of healthcare for dogs. By utilizing sophisticated AI and machine learning technology, this system seeks to provide dog owners with a powerful tool to efficiently manage their dogs' health.

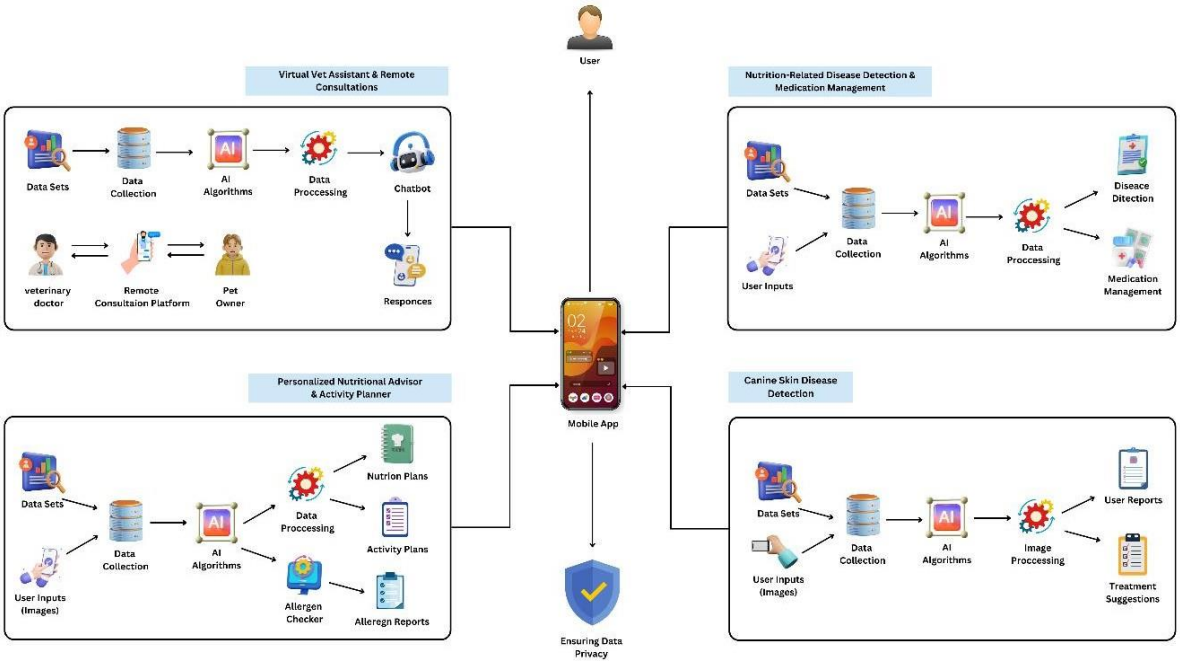
6. Brief description of the nature of the solution including a conceptual diagram (250 words max)

The suggested AI-driven system consists of four primary components: Virtual Vet Assistant and Remote Consultations, Nutrition-Related Disease Detection and Medication Management, Personalized Nutritional Advisor & Activity Planner, and Canine Skin Disease Detection. Every individual part employs artificial intelligence and machine learning to offer distinct capabilities. The Virtual Vet Assistant enables telemedicine consultations and assists in the assessment and categorization of symptoms. The Nutrition-Related Disease Detection system utilizes food intake and symptom monitoring to identify illnesses at an early stage and effectively manage medication regimes. The Personalized Nutritional Advisor provides

7 customized food and activityrecommendations.

The Canine Skin Disease Detection utilizes picture recognition technology to assess skin diseasesin dogs. These components together create a comprehensive healthcare system for dogs, improving the accessibility, customization, and effectiveness of veterinarian treatment.

Proficiency in many fields such as veterinary science, artificial intelligence, machine learning, and health informatics is necessary for the creation of this AI-powered canine healthcare system. Veterinary competence is crucial in guaranteeing the precision and pertinence of health-related advice and recommendations. AI and machine learning experts are required to create and improve the algorithms that drive the virtual assistant, symptom checker, nutritionalanalysis, and picture identification for skin conditions. Moreover, proficiency in health informatics is essential for effectively overseeing and evaluating health data. The data requirements encompass a thorough compilation of canine health records, food information, photos depicting skin disorders, and input from veterinary specialists. It is crucial to guarantee data privacy and adhere to applicable legislation.



8. Objectives and Novelty

Main Objective To develop an AI-driven comprehensive healthcare system for dogs that enhances accessibility, personalization, and efficiency in veterinary care.			
Member Name	Sub Objective	Tasks	Novelty
Thisera W.N.M	Develop a system to effectively identify nutrition-related diseases and manage corresponding medications.	• **Monitor Dietary Intake:** Track and record the canine's dietary consumption to assess nutritional patterns. • **Analyze Health Data:** Evaluate health data to identify potential correlations between diet and health outcomes. • **Early Disease Detection:**	Introduce an innovative system that integrates real-time dietary monitoring, advanced analytics for early disease detection, and comprehensive medication management to provide personalized health recommendations and ensure effective treatment for nutrition-related diseases.

		Utilize data analysis to detect early signs of nutrition-related diseases. • **Medication Schedule Management:** Organize and manage medication schedules to ensure adherence and effectiveness. • **Side Effects and Interaction Warnings:** Provide alerts regarding potential side effects and drug interactions. • **Personalized Health Recommendations:** Offer tailored health recommendations based on dietary and health data.	

Jayarathna P.G.L.N	Develop a system for personalized canine meal plans and exercise routines, incorporating allergy management, real-time health monitoring, and adaptive feedback.	• **Personalized Meal Plans:** Customizing diets based on the dog's breed, age, weight, and health conditions using AI-driven recommendations, while also adjusting for current weather conditions to optimize nutritional benefits. • **Allergy Management:** Create a system to identify and manage food allergies, updating meal plans to avoid allergens. • **Interactive Meal Planning Tools:** Design tools for users to create and adjust meal plans interactively, considering weather and health needs.	Our cutting-edge Personalized Nutritional Advisor & Activity Planner revolutionizes canine care by providing customized meal plans and exercise routines, comprehensive allergy management, continuous health monitoring, and adaptive user and veterinary feedback, ensuring dynamic, tailored support for every canine's well-being.

		• **Health Progress Monitoring:** Track and analyze health metrics to evaluate the effectiveness of meal and exercise plans. • **Design Exercise Routines:** Create tailored exercise routines, adjusting for breed, age, health status, and weather conditions. • **Exercise Plan Customization:** Customize exercise plans based on real-time weather updates and health status. • **Reminders and Alerts:** Set up reminders and alerts for meals and	

		exercise, including adjustments for weather. • **Veterinary Feedback Integration:** Incorporate feedback from veterinarians to refine and enhance nutritional and exercise plans. • **User Feedback and Continuous Improvement:** Gather user feedback to continuously improve meal and exercise plans, ensuring they meet evolving health and lifestyle needs.	
Mendis N.U.P. S	Develop a specialized Virtual Vet Assistant and Remote Consultation platform that delivers tailored responses and recommendations exclusively for canines.	• **Chatbot Development:** Design and implement a chatbot that offers personalized responses and support specifically tailored for canine health needs.	

		• **Remote Consultation Platform:** Develop a platform to facilitate virtual consultations between pet owners and veterinarians, enabling remote veterinary care. • **Integration of Telehealth Triage System:** Incorporate a telehealth triage system to assess and prioritize canine health issues remotely, enhancing the efficiency of initial evaluations. • **Enabling Virtual Consultations:** Implement features to enable real-time virtual consultations, providing comprehensive veterinary care and advice.	

		• **Veterinary Feedback Integration:** Integrate feedback mechanisms from veterinarians to continually refine and improve the virtual consultation experience. • **User Feedback and Continuous Improvement:** Collect and analyze user feedback to drive ongoing enhancements in platform functionality and user experience. • **Interactive Symptom Checker:** Develop an interactive symptom checker to assist users in identifying potential health issues in their canines.	

Gamage T.G.S.N	Develop a system for detecting canine skin diseases that integrates with ongoing health compatibility assessments to provide comprehensive diagnostics and tailored treatment recommendations.	• **Implement Image Recognition:** Develop and integrate a robust image recognition system to accurately capture and analyze canine skin conditions. • **Analyze Skin Images:** Process and evaluate skin images to identify potential anomalies or signs of disease based on visual patterns. • **Early Disease Detection:** Utilize advanced algorithms to detect early signs of skin diseases, enabling prompt intervention and management. • **Provide Diagnosis and Treatment Suggestions:** Generate diagnostic reports and recommend personalized treatment options based on the analyzed data and	Introduce a novel approach to canine skin disease detection by leveraging advanced image recognition technology to provide precise diagnoses and the most accurate, personalized treatment suggestions, integrating ongoing health data for enhanced treatment efficacy.

		ongoing health conditions of the dog. • **Check Symptoms Considering Ongoing Health:** Cross-reference observed skin symptoms with the dog's current health status to ensure accurate diagnosis and effective treatment planning.	

9. Supervisor checklist

a) Does the chosen research topic possess a comprehensive scope suitable for a final-year project?

Yes		No	

b) Does the proposed topic exhibit novelty?

Yes		No	

c) Do you believe they have the capability to successfully execute the proposed project?

Yes		No	

d) Do the proposed sub-objectives reflect the students' areas of specialization?

Yes		No	

e) Supervisor's Evaluation and Recommendation for the Research topic:

10. Supervisor details

	Title	First Name	Last Name	Signature
Supervisor	Ms.	Bhagyanie	Chathurika	
Co-Supervisor	Mr.	Deemantha	Siriwardana	
External Supervisor	Dr.	Damindu	Wickramasinghe	
Summary of external supervisor's (if any) experience and expertise				

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Topic Assessment Form

<u>This part is to be filled by the Topic Screening Panel members.</u>

Acceptable: Mark/Select as necessary

Topic Assessment Accepted	
Topic Assessment Accepted with minor changes (should be followed up by the supervisor)*	
Topic Assessment to be Resubmitted with major changes*	
Topic Assessment Rejected. Topic must be changed	

* Detailed comments given below

Comments

The Review Panel Details

Member's Name	Signature

*__Important__:

1. According to the comments given by the panel, make the necessary modifications and get the approval by the **Supervisor** or the **Same Panel**.
2. If the project topic is rejected, identify a new topic, and follow the same procedure until the topic is approved by the assessment panel.