

CHAPTER 1 - INTRODUCTION

1.1 Background

Indonesia has a ratio of veterinarians and animal clinics that is very disproportionate to the pet population. According to a study conducted by Royal Canin in Indonesia in 2019 (Chatnews Indonesia, 2023), there is a ratio of one veterinarian for every 9,100 pets and one clinic for every 21,000 pets. This is a stark contrast compared to the data from the American Veterinary Medical Association which states that there is one veterinarian for every 1,300 pets in 2017 in the United States (American Veterinary Medical Association, 2017).

According to XYZ Clinic, one of the main reasons for the lack of veterinarians in Indonesia is because junior veterinarians need to have 2-3 years' worth of working experience before they can be a proper veterinarian. Junior veterinarians often make the mistake of misdiagnosing animals. This often causes delay in treating sick animals because they need to be diagnosed again by more professional veterinarians.

To solve that problem, XYZ Clinic came up with the idea of a program that can be used to identify animal diseases based on given symptoms. This program is proposed with the hope that it can help senior and junior veterinarians in diagnosing animals. The author developed machine learning models for making predictions based on given symptoms and implemented the models into a web-based application.

1.2 Research Problems

With a considerably low vet to pet ratio, misdiagnoses caused by junior veterinarians can hinder the process of diagnosing animals. It can cause delay in the process of treating sick animals because the animals need to be diagnosed again by senior veterinarians. Without proper guidance, junior veterinarians can take more than 3 years to become experienced in diagnosing sick animals.

The goal of this research is to develop machine learning models and implement them to create a prediction based on given symptoms to help the junior veterinarians in making diagnoses during their training years. This research also aims to determine the models that have the fastest training time and also the models that can produce the highest accuracy.

1.3 Research Objectives

1. To develop machine learning models for each disease to give a diagnose based on given symptoms that has the highest accuracy and fastest training time.
2. To implement the models into a web-based application to be used by junior veterinarians in XYZ Clinic.

1.4 Significance of Study

1. Junior veterinarians can use the program to help them identify the disease of pet dogs.
2. The result obtained from this research can be used as a base for other researches related with dogs or other animal diseases in the future.

1.5 Research Questions

Question #1: What algorithm will have the highest accuracy overall?

Question #2: What algorithm will have the fastest training time?

Question #3: Will the diagnose made by the program be helpful enough to assist veterinarians, especially junior veterinarians in diagnosing animals?

1.6 Hypothesis

1. The program can give accurate predictions of dog diseases based on given symptoms.
2. The algorithm with the fastest training time does not have to be the same model that has the best accuracy.
3. The program is useful in helping junior veterinarians making diagnoses during their training years.

1.7 Scope of Study

1. Accuracy of each algorithm.
2. Training time of each algorithm
3. Dataset gathered from medical records

1.8 Limitations

1. The quality of data gathered from XYZ Clinic.
2. Total number of diseases to be trained on the models.
3. Hardware capabilities to train the models.