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## Abstract

We use predictive analytics methods to predict how likely a sheltered pet is to be adopted using an ads pet description and visual image of the pet. The motivation for this study is twofold. First, there are millions of pets that need a home and being able to predict what drivers about the ad or image lead to them finding a forever home is paramount. Secondly, while our research focus is on pet adoption, our methodology could be extended to many other business areas. For example, retailers provide images of their products along with product descriptions. Using our predictive analytics design they could follow a similar approach to better wordsmith their product descriptions and showcase their products which could lead to increased business performance.

## Introduction

1.5 million shelter animals are euthanized each year. Humanitarians and pet enthusiasts around the world are forced to ask the same questions: Why do some pets get adopted quickly, while others endure long stays at shelters? Is there something about the pets that are adopted into forever homes that are more appealing than others?

<https://esadoctors.com/top-animal-rescues-shelters-california/#prettyPhoto>



Our research has focused on developing an algorithm using R that has both high predictive power but also is interpretable. Our hope is that by creating an algorithm to predict adoptability, we can save more pet lives! By knowing what makes an animal likely to be adopted by a family, we can then increase adoptability for those pets originally deemed 'less likely' to be adopted.

### Research Questions:

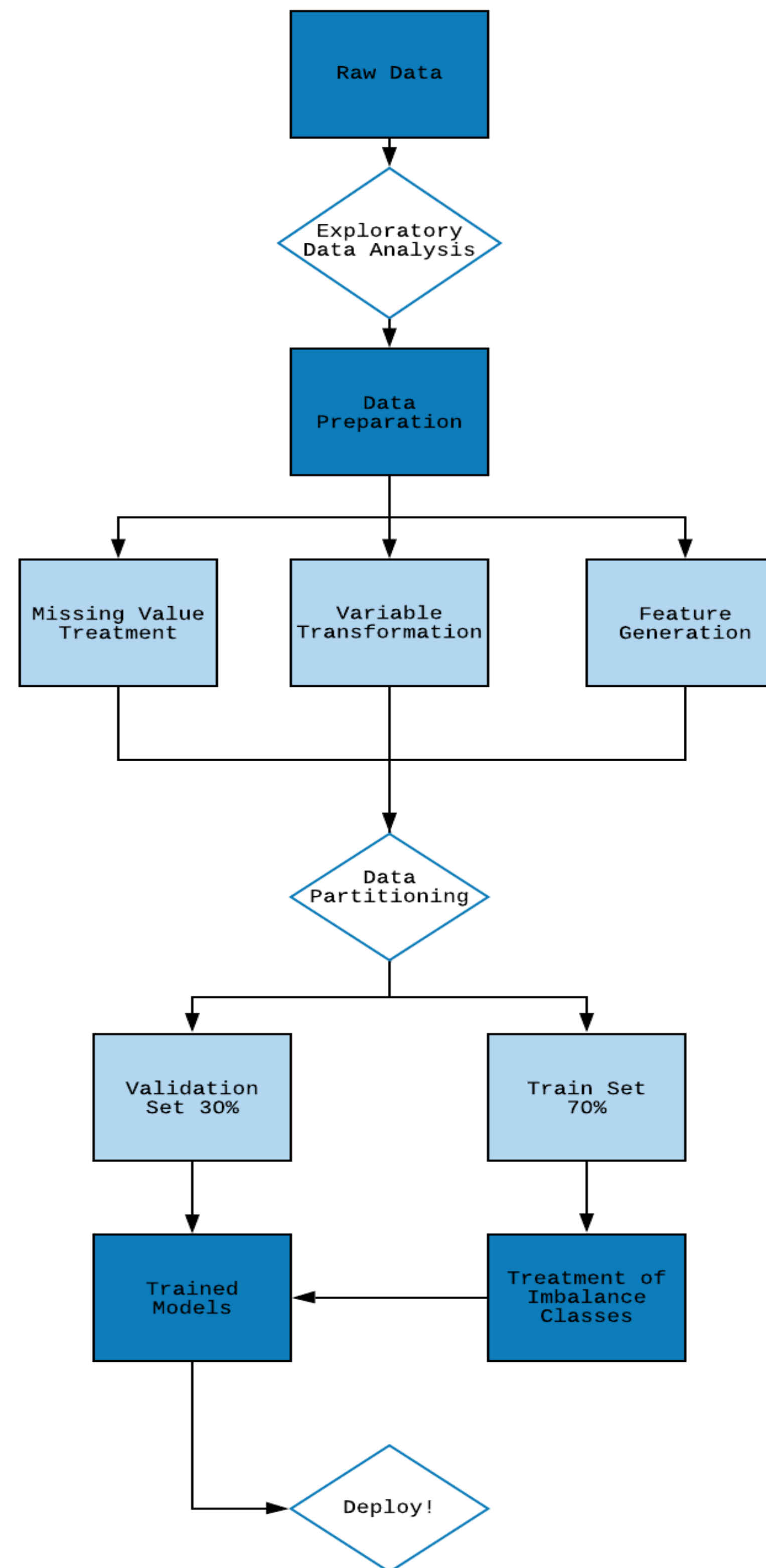
- Which parameters affect the speed of pet adoption?

## Literature Review

Our study is novel since we are going to analyze both the images and the ads to see how they influence the adoption/purchase. In addition, our methodology provides a framework that other business areas could use to analyze how their product descriptions or images influence purchase propensity.

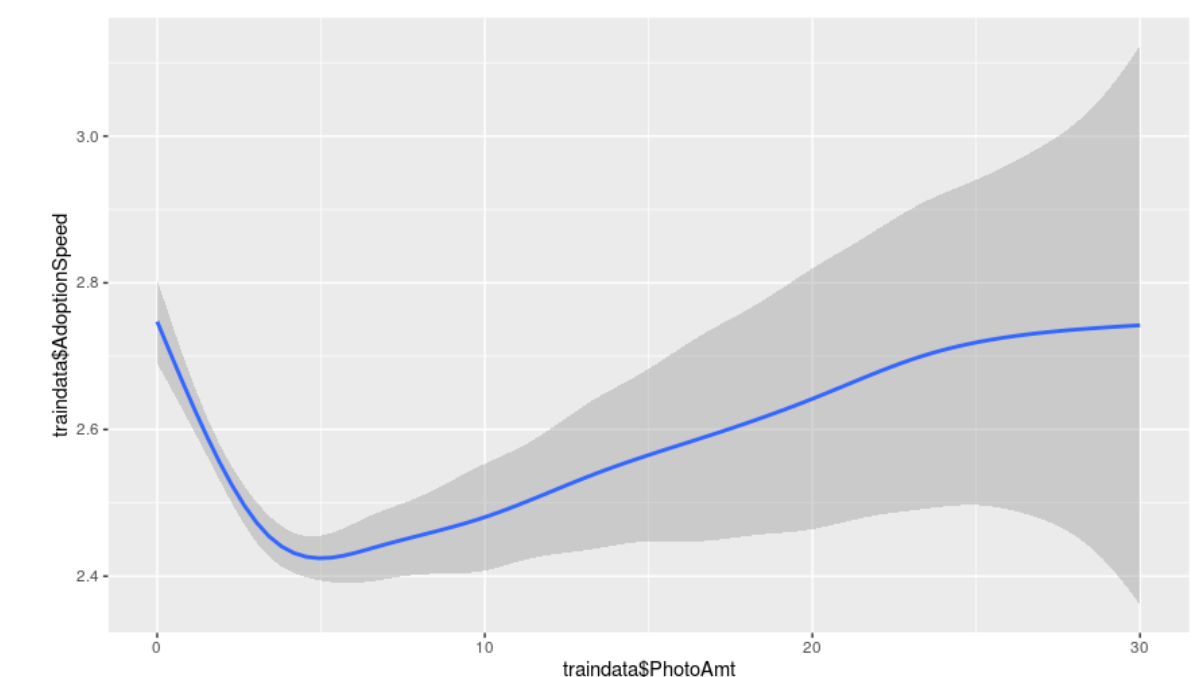
Study	Pet Adoption	Analytics Tool(R studio)	Data Mining	Focus on description & design	Image of the pets
Dlamini, 2015	X	X	X		
Kaylee, 2013	X	X	X	X	
Dowling, 2018	X			X	
Our study	X	X	X	X	X

## Methodology



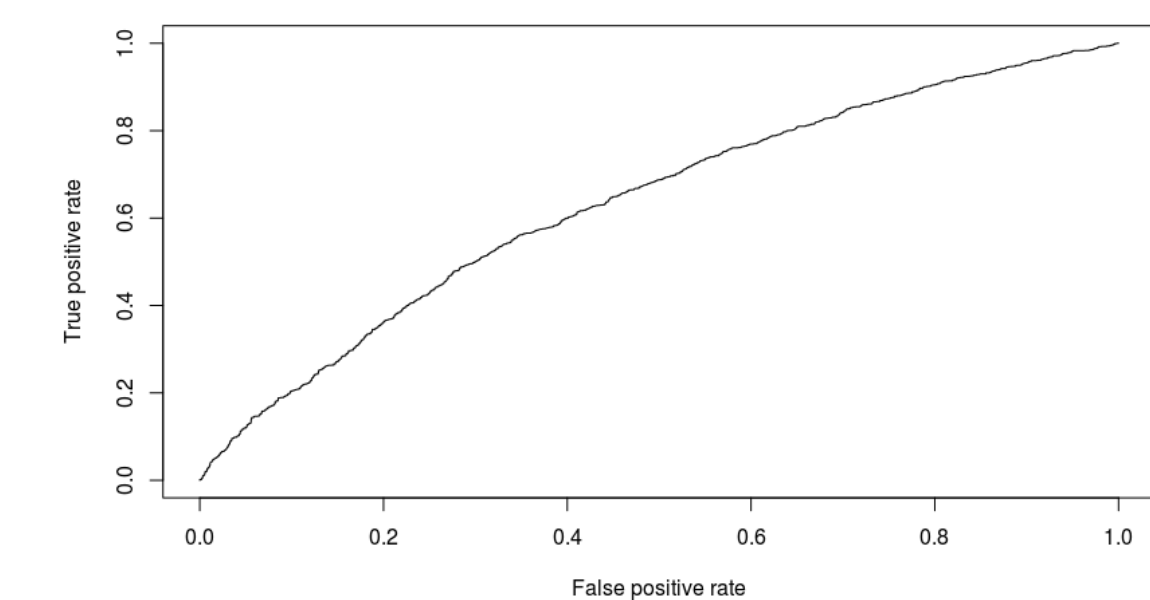
## Results

### Amount of Photos per Animal vs. Adoption Speed

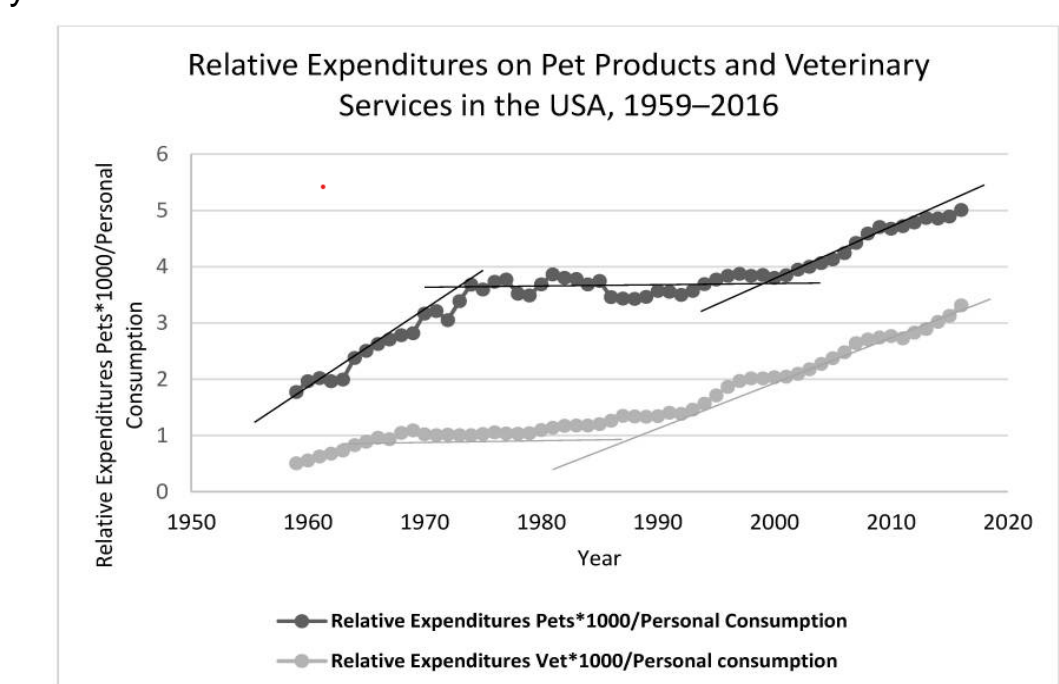


The figure above shows a comparison between Adoption Speed and Photo Amount. As the Photo Amount passes the amount of 5, the impact on Adoption speed increases.

### Confusion Matrix



With the model that we created states that we can predict Pet Adoption speed with an accuracy of 63.44%.



## Conclusions

Our goal for this model was to create a way to accurately predict the Adoption Speed of animals using the variables given to us. With the data – we can conclude that the more pictures used in advertisement for the animal, the more likely that animal is to be adopted. We can conclude this with an accuracy of 64.33% To tie back to our research question, this parameter will affect the speed of adoption. A larger amount of diverse photos of the animal will lead to a faster adoption rate. Using Survival Analysis, we can also predict the time it will take for pets with certain amounts of photos to be adopted. Our findings can be further improved by creating features in the data that serve as false data in order to predict in a scenario analysis. Had we had more time with the data, we would have been able to create these scenarios, and show how much of an improvement this would create. With more pictures leading to a faster adoption rate, shelters can save on costs to maintain the sheltering of these pets, therefore providing the ability to utilize funds in more efficient ways.

## Acknowledgements

We thank Professor Matthew Lanham for constant guidance on this project.