Predicting Timely Adoption and Optimizing Adoption Channels for Shelter Animals
Executive Summary

Rebecca V. Lewis | Bellevue University | DSC 630 - Amirfarrokh Iranitalab |August 8, 2020

The objective of this project is to determine if taking a closer look at shelter data and animal characteristics can not only predict the likelihood that an animal will be adopted out quickly, but also direct shelter managers to make subtle changes that will decrease the length of stay for animals and effectively route them through the best adoption channel. The data used to conduct this analysis comes from the Louisiana SPCA located in Algiers, Louisiana, contains animals who were taken in between January 1, 2015 and December 31, 2019 with an adoption date by February 29, 2020, and was retrieved from their shelter management software, PetPoint. Dogs and cats were analyzed separately as they have different factors that can impact adoptability. Kittens and puppies below 2 months of age were removed from the dataset because they are often in foster care for weeks until they are old enough to be placed for adoption. Animals that were returned to the shelter were also filtered out of the data to avoid duplicate observations.

Multiple algorithms were evaluated to determine if we could predict if a dog or cat would be adopted timely, within seven days. The overall prediction strength for all the models was low because the number of animals adopted in this window of time was much lower than those who remained at the shelter longer. We were able to identify specific models that was best at predicting this event for cats and dogs. Overall adoptions of cats within the timeframe of seven days provided stronger prediction scores than dogs. More analysis is recommended with a longer window of time and more fine tuning to the model. The final model can be used as a detection tool used to choose animals who may need additional exposure either through offsite programs, better placement in the shelter or marketing campaigns.

Multiple algorithms were evaluated to determine if we could predict the adoption class for dogs and cats. The overall prediction strength for all the models was low most likely because most of the adoptions took place onsite. Dogs were more likely than cats to be adopted through a foster or offsite

program, and specific models were identified as the strongest for these predictions. Moderately strong

models were identified for predicting cats suited for the barn cat and retail offsite program. Not enough

data was present for veterinary offsite programs to make a prediction. More analysis is recommended

for each program independently, starting with the strongest model observed through that program and

fine tuning it to produce better results. The final models for each program can be used to assign scores

to each animal associated with their adoption likelihood through that program, creating a tool to use

when deciding how to route an animal through the system.

　　　While the results of this study do not solve the problem of reducing the length of stay for shelter

dogs and cats, the results indicate that data science can be a helpful tool in improving shelter outcomes

and provide a basis for continuing research.

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