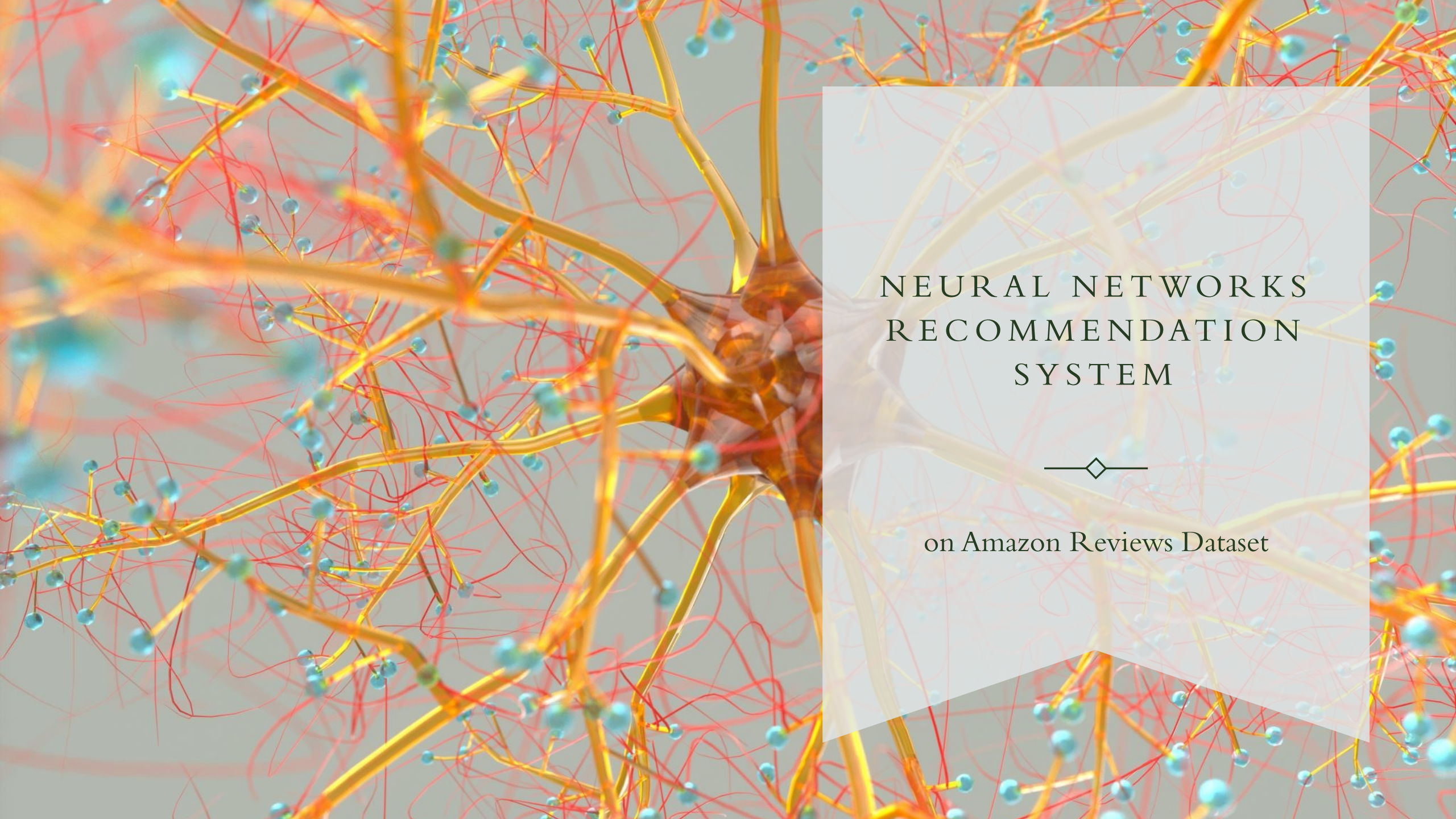


# NEURAL NETWORKS RECOMMENDATION SYSTEM

on Amazon Reviews Dataset

# TensorFlow

OBJECTIVE:  Explore Neural Networks by using TensorFlow Recommenders to address Cold Start problem.

PROJECTED OUTCOME:  Test Retrieval, Ranking, Sequential models.

# Outline

BUSINESS PROBLEM

DATA AND METHODS

RESULTS

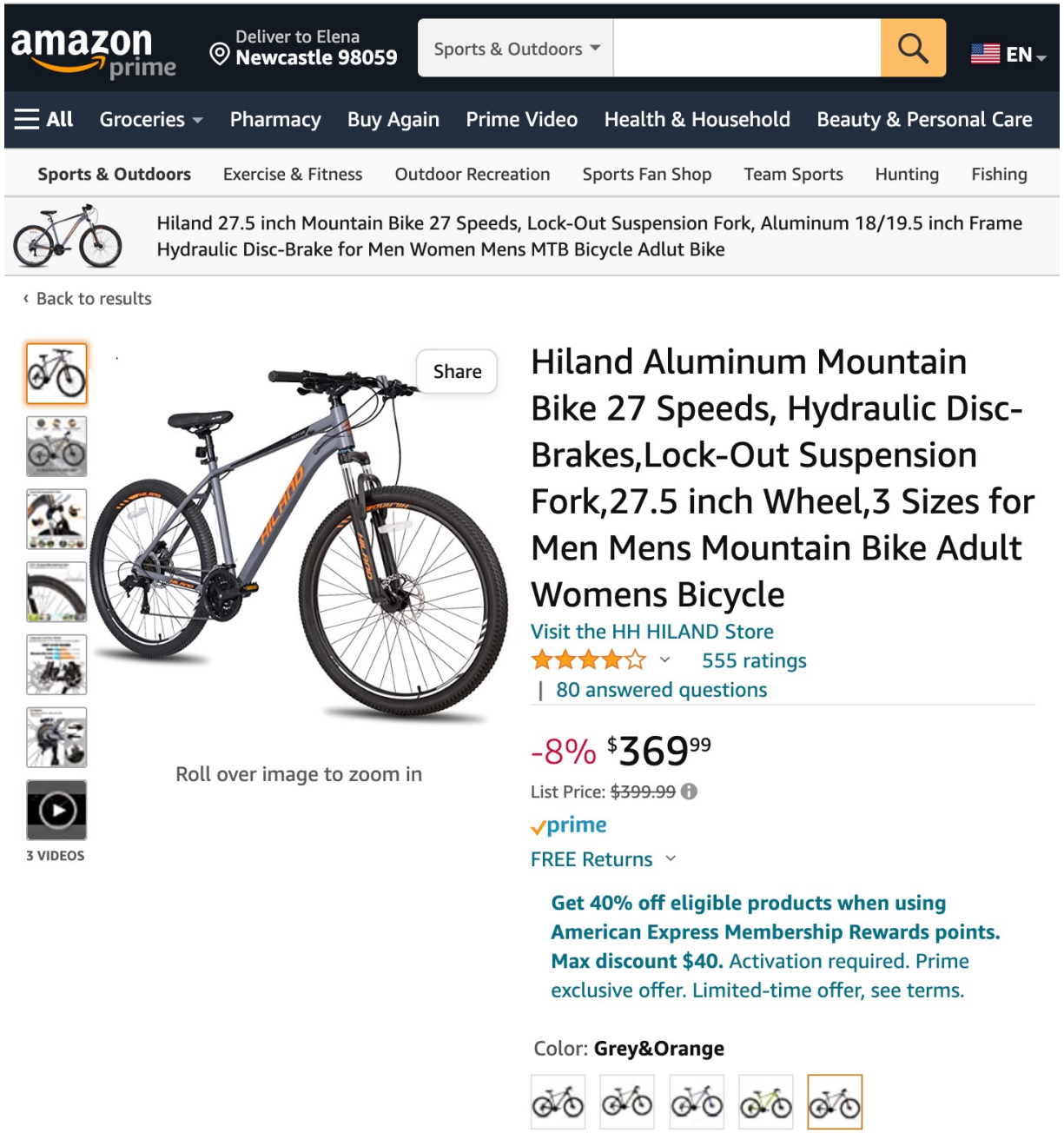
CONCLUSIONS

# Business Problem

Stakeholder: Marketing team

Low user penetration in US (20% at 2022)

Cold Start Problem




# DATA & METHODS

DATA:

2.3M Outdoor product reviews (2000 – 2015)

FEATURES:

Product title, review title, review, review date, votes

DATA SOURCE:

Amazon Reviews dataset

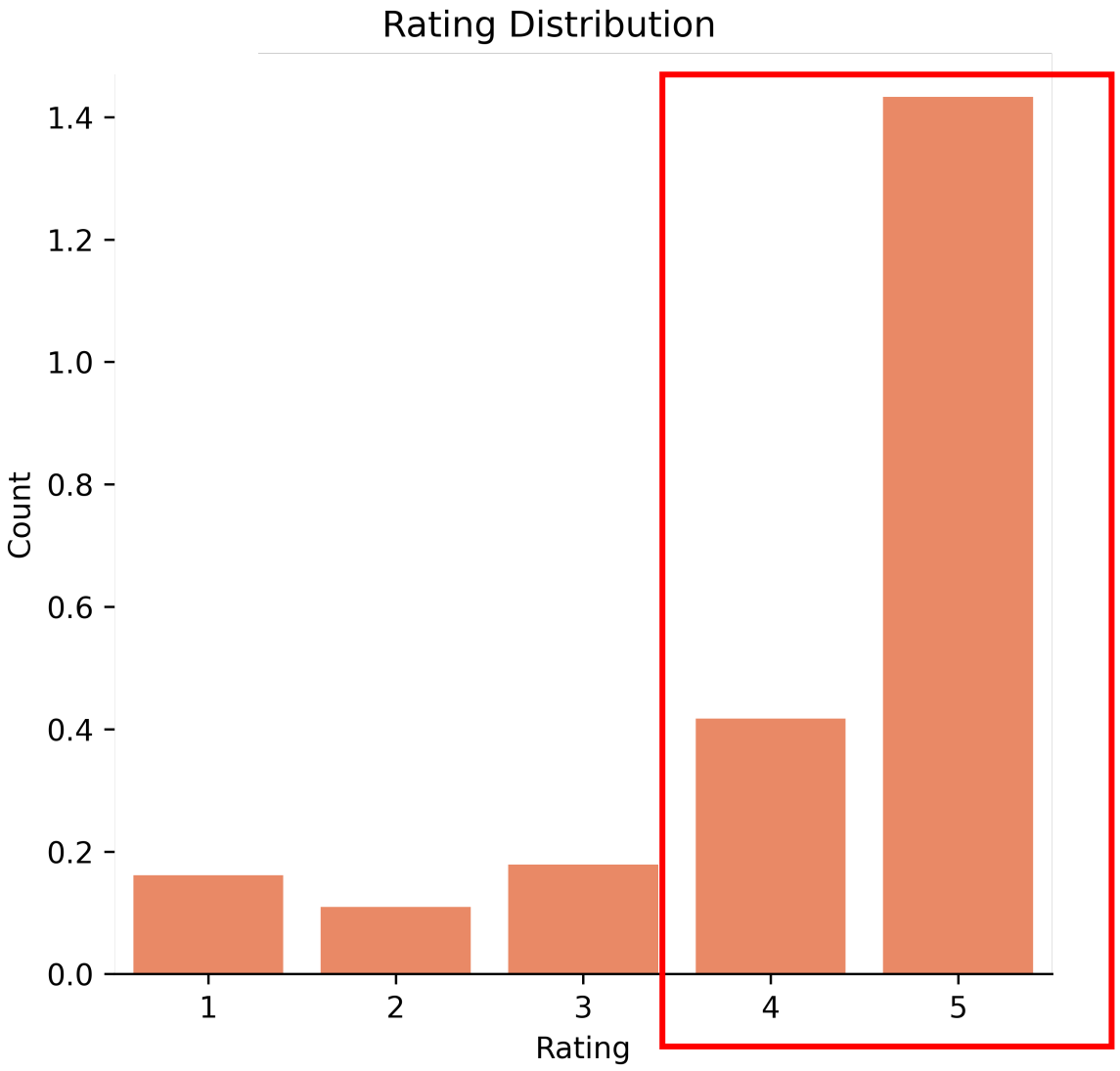
RECOMMENDATION SYSTEMS:

Retrieval

Ranking

Sequential

Combined Features




Star Rating Distribution:

62.4% - 5 star

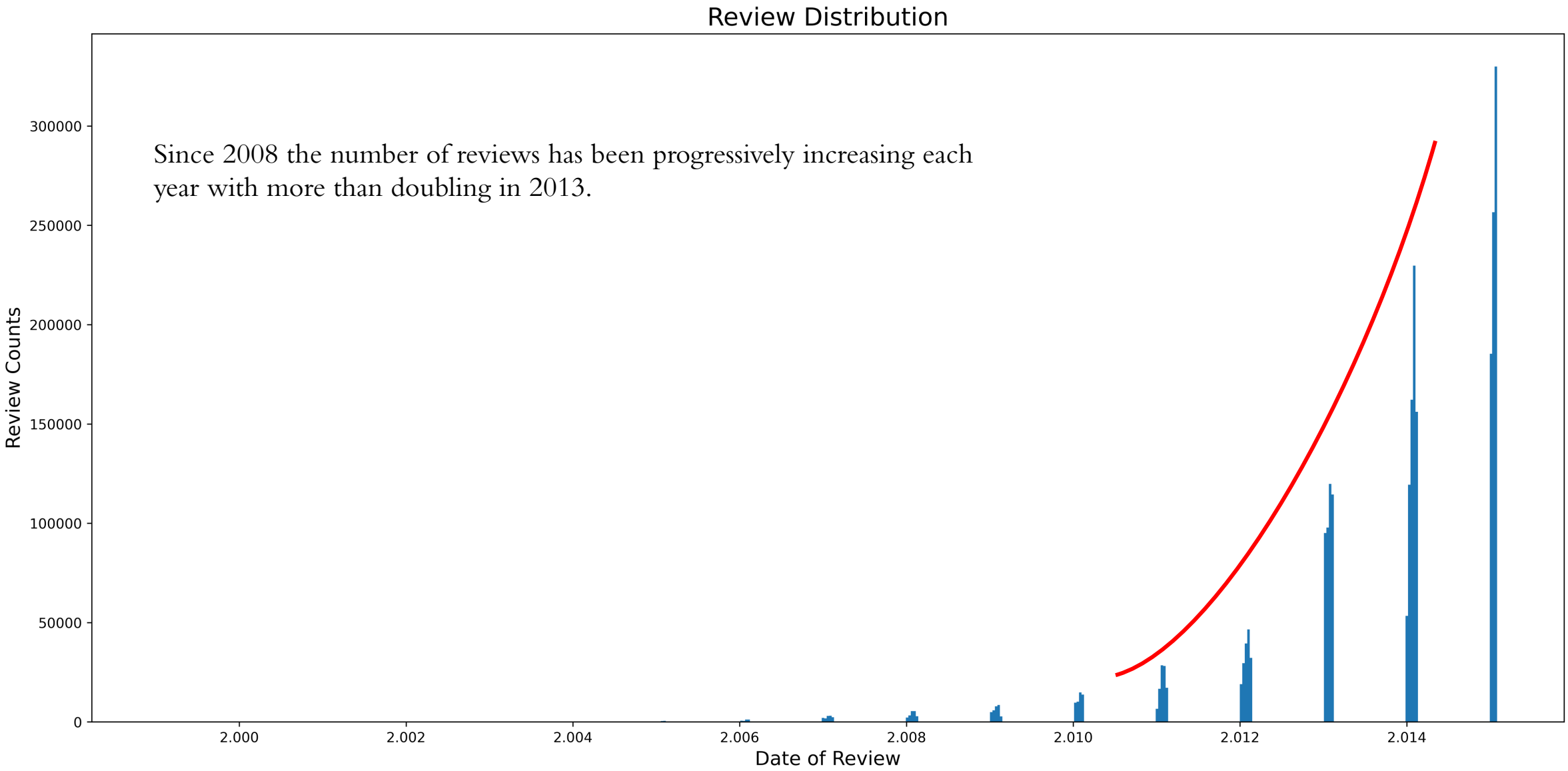
18.1% - 4 star

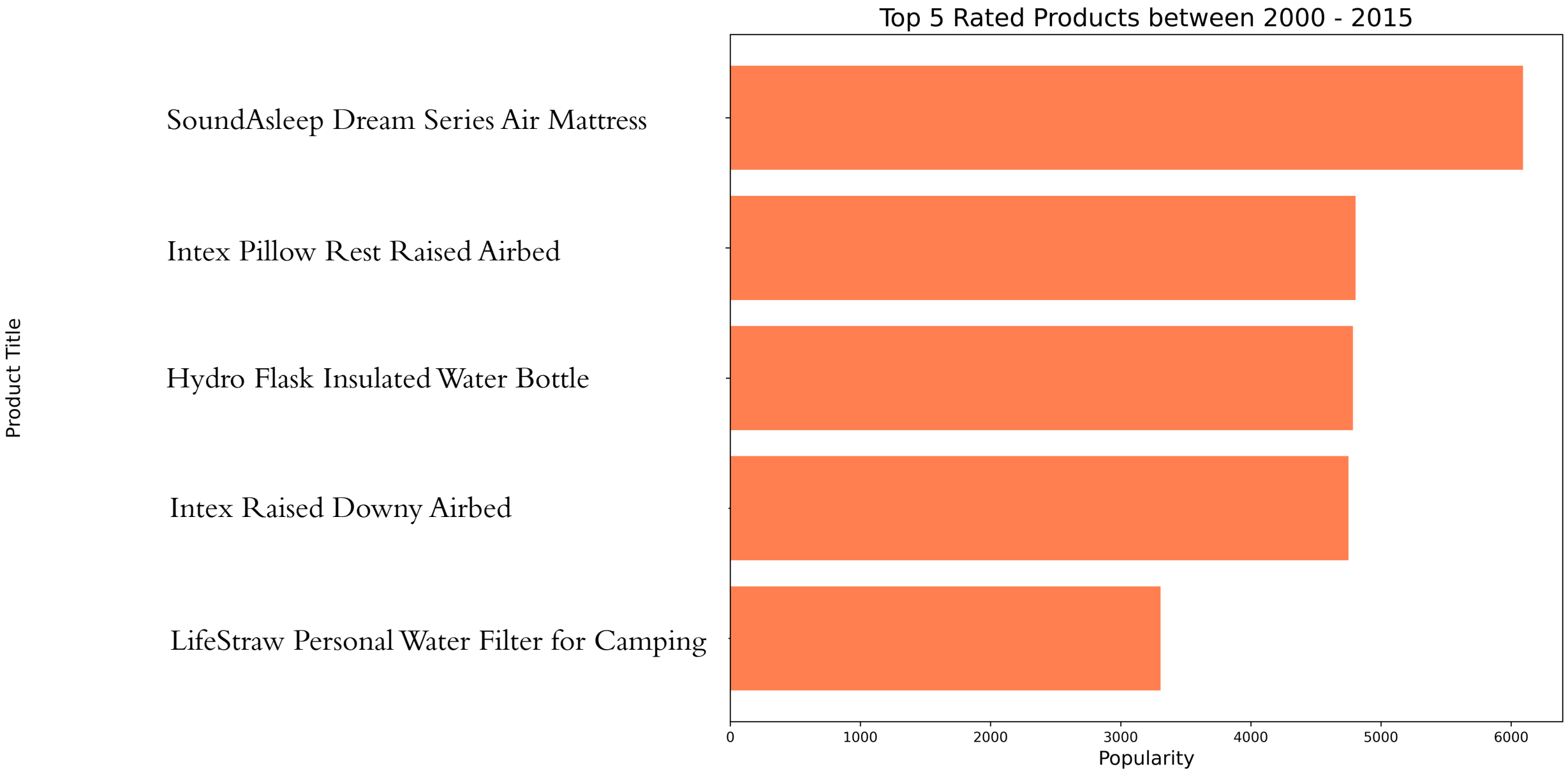
7.6% - 3 star

4.7% - 2 star

7.1% - 1 star

Rating distribution is skewed left indicating that customers tend to leave positive ratings.


Review Distribution
Since 2008 the number of reviews has been progressively increasing each year with more than doubling in 2013.
Review Counts
300000
250000
200000
150000
100000
50000
0
2.000
2.002
2.004
2.006
2.008
2.010
2.012
2.014
Date of Review


Top 5 Rated Products between 2000 - 2015
SoundAsleep Dream Series Air Mattress
Intex Pillow Rest Raised Airbed
Hydro Flask Insulated Water Bottle
Intex Raised Downy Airbed
LifeStraw Personal Water Filter for Camping
Product Title
0
1000
2000
3000
4000
5000
6000
Popularity

# Item-to-item Retrieval Model

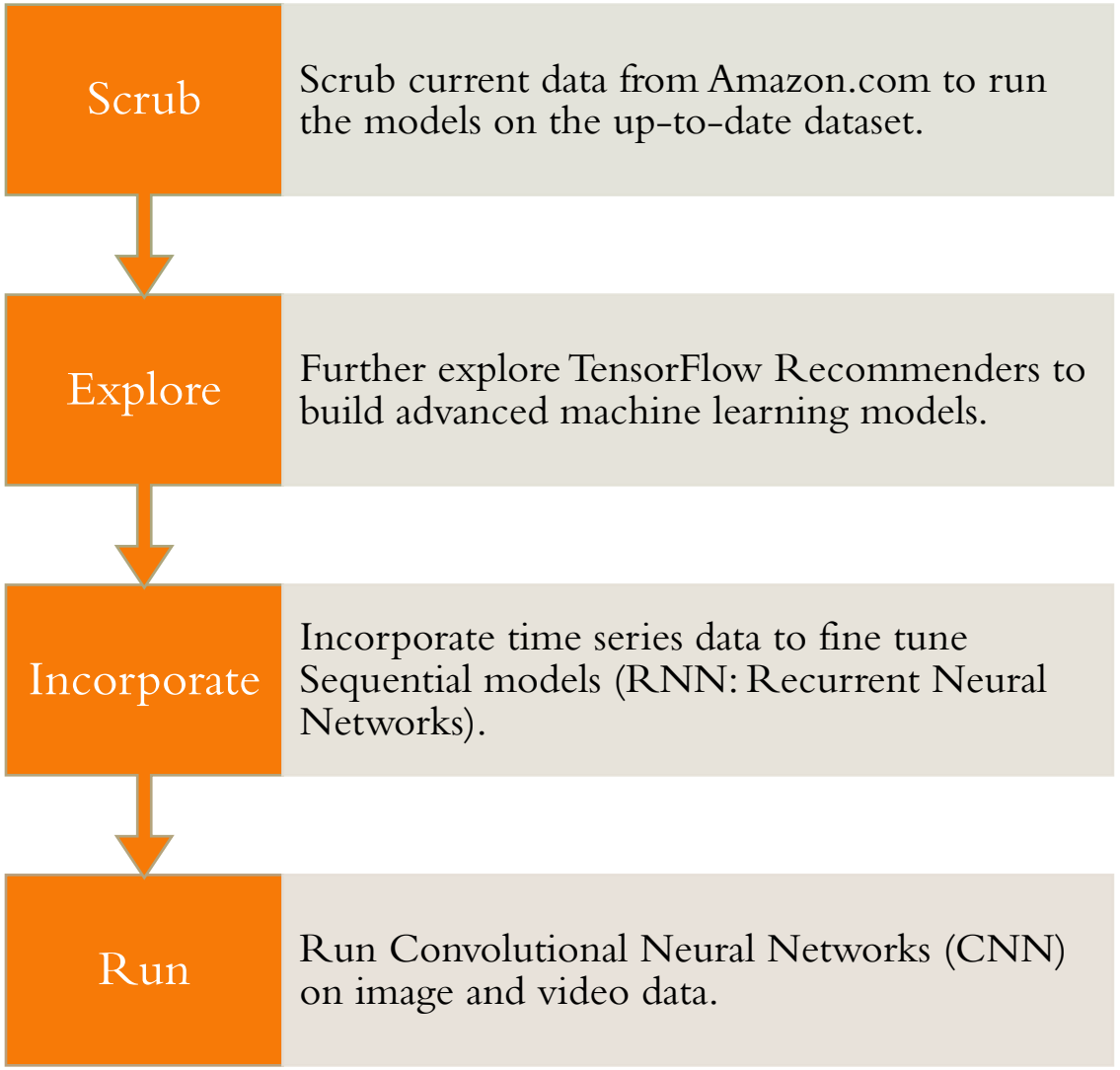
Accuracy rate of Top-10 recommendations is 63.26%

# BUSINESS RECOMMENDATIONS

A/B test item-to-item Retrieval TensorFlow model on the website.

Implement ScaNN for efficient and fast serving.

# NEXT STEPS


Scrub
Scrub current data from Amazon.com to run the models on the up-to-date dataset.
Explore
Further explore TensorFlow Recommenders to build advanced machine learning models.
Incorporate
Incorporate time series data to fine tune Sequential models (RNN: Recurrent Neural Networks).
Run
Run Convolutional Neural Networks (CNN) on image and video data.

# THANK YOU

Link to Notebook