

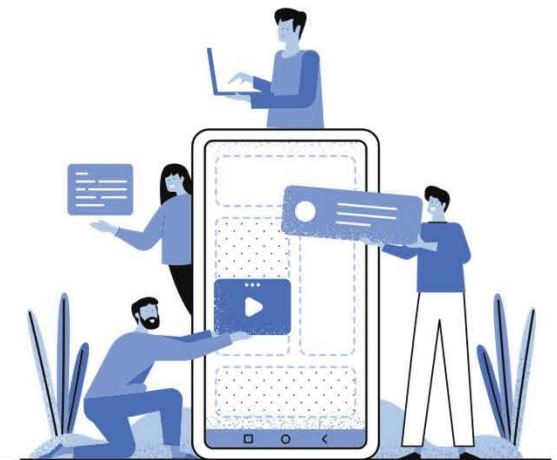
S H O P I F Y
A P P
R E V I E W S

Sentiment Analysis and Topic Modeling

JONATHAN PARK

App Stores and User Reviews

- User feedback^[1-3]
 - High quality: bug reports, feature requests
 - Low quality: insults, spam
- Communication channel^[4]



Problem Statement

Using machine learning on Shopify App store user reviews, can I identify the words predictive of review sentiment and the different topics that reviews fall under?

Value Generated

Automated and improved understanding of user reviews and streamlined process to gather and direct high-quality feedback to relevant stakeholders for improved user experience and retention.



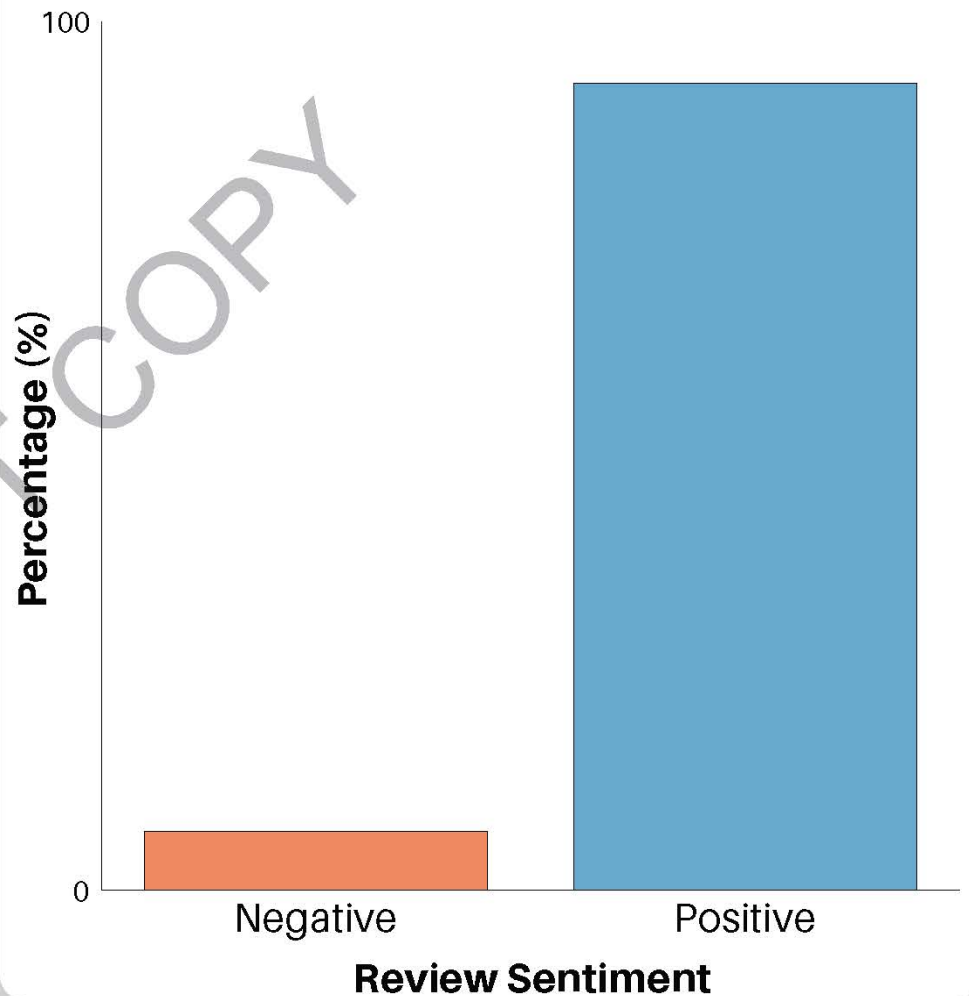
Data Overview

- Kaggle Dataset^[5]
- 446,973 reviews



= Negative

= Positive



[5] <https://www.kaggle.com/datasets/username3/shopify-app-store?select=apps.csv>

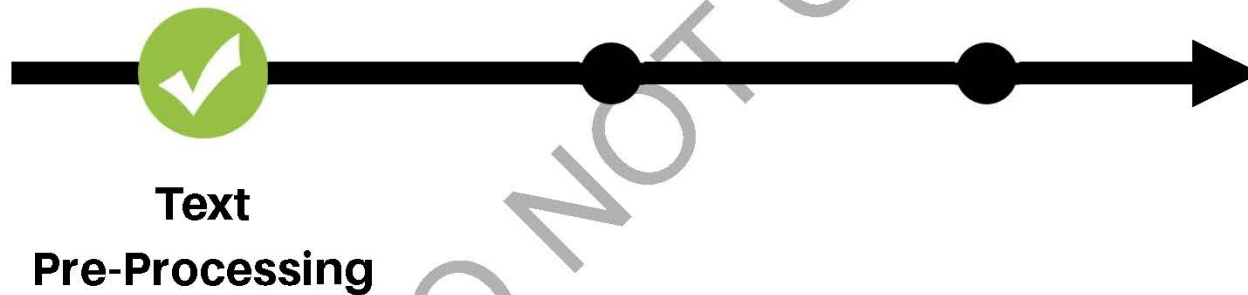
2019

Developer responses
appeared

49%

All negative reviews
received developer
responses

Pre-Processing and Modeling



This app is so goooooooooood1!



this app is so good



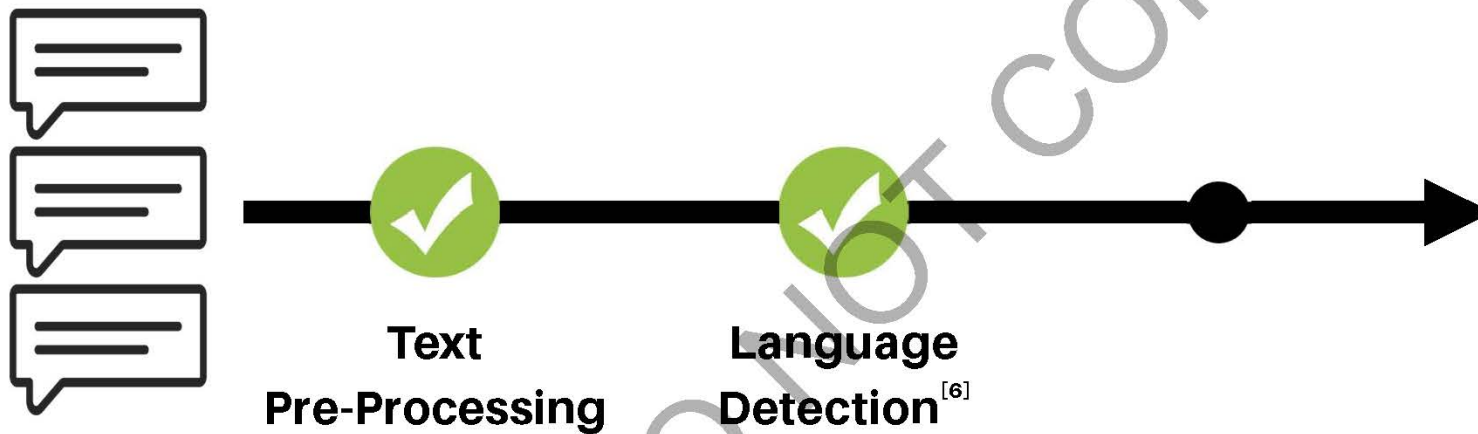
this app is so good

~~wordle~~
sentle?



app	good	is	so	this
1	1	1	0	2	0	1	1

Pre-Processing and Modeling



32*

Different languages
with greater than 10
reviews

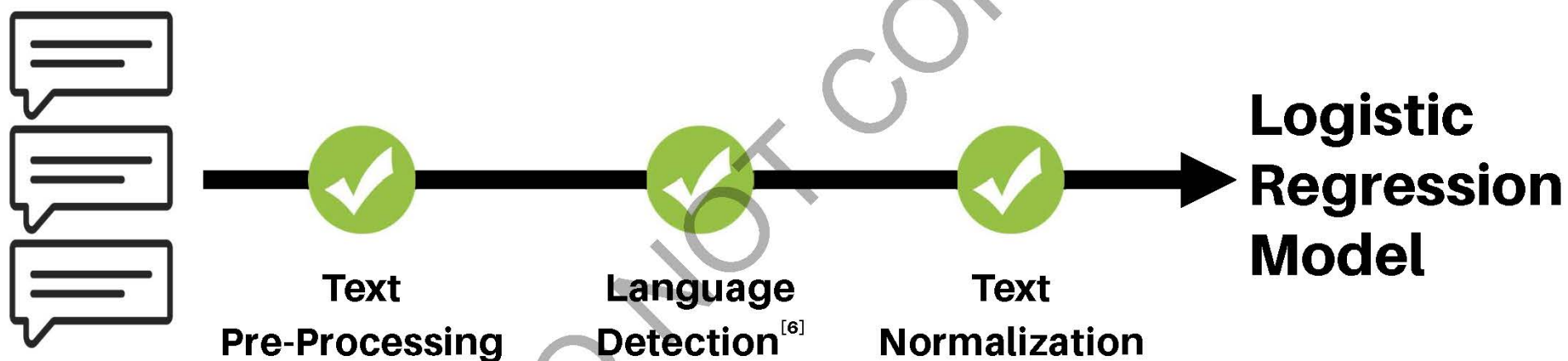
26%

Multi-lingual negative
reviews received
developer responses

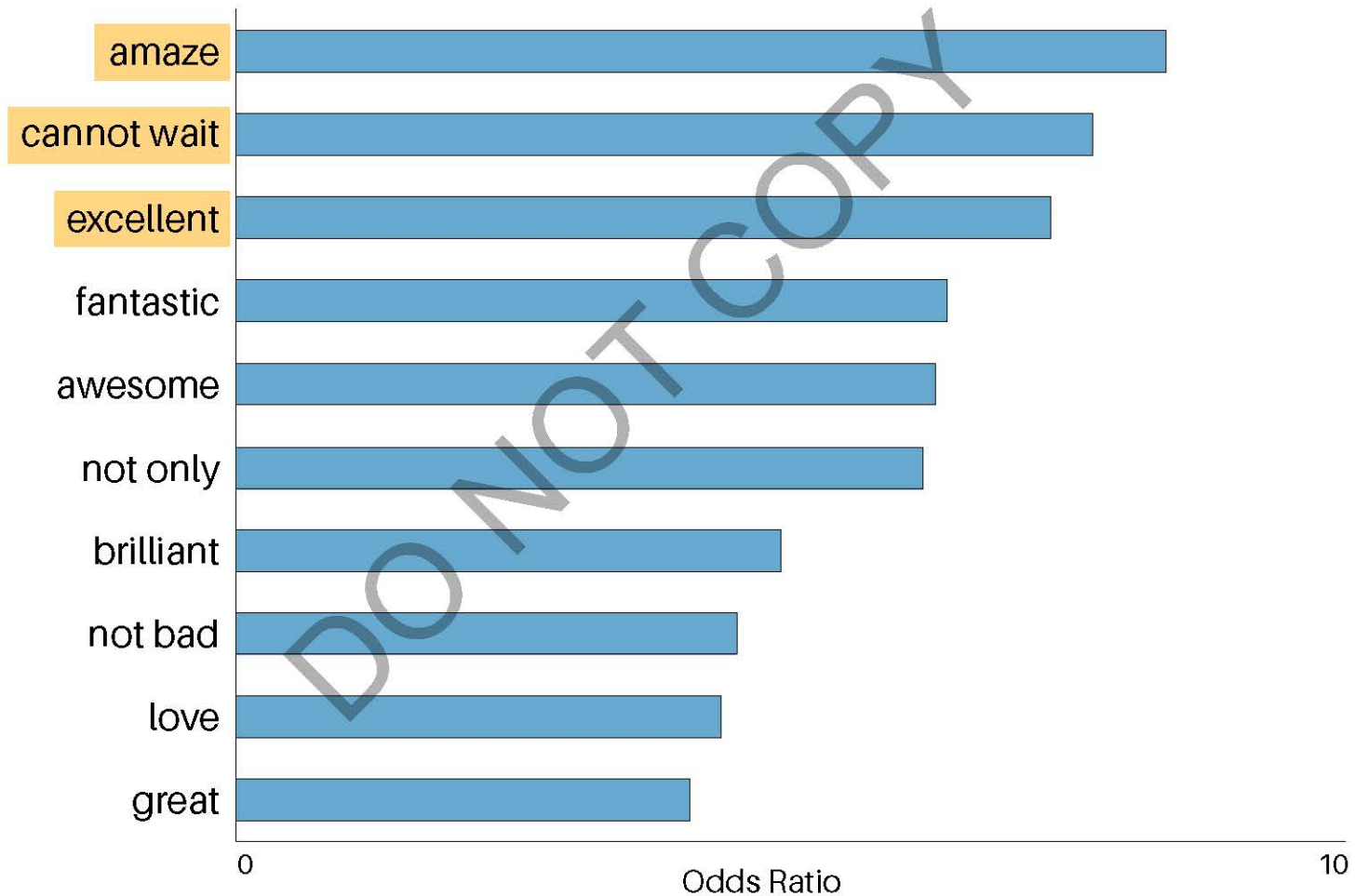
70%

English

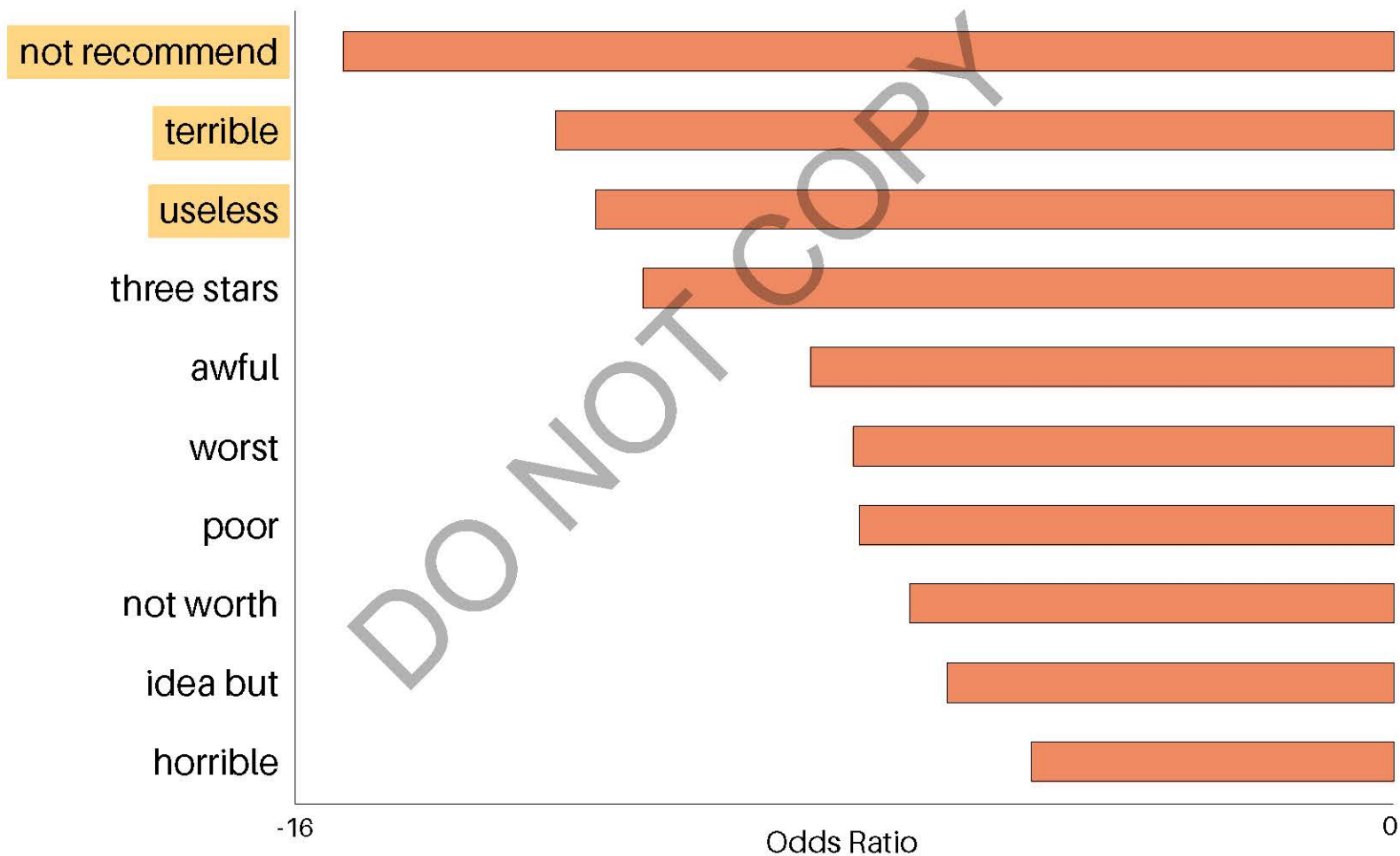
Pre-Processing and Modeling



Top 10 Tokens Predictive of Positive Reviews



Top 10 Tokens Predictive of Negative Reviews



Train Data

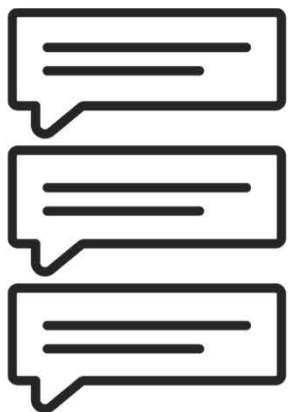
Accuracy = 97.0%

	Precision	Recall
True 0 [Neg Review]	89%	65%
True 1 [Pos Review]	97%	99%

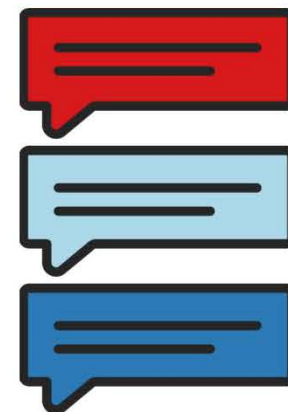
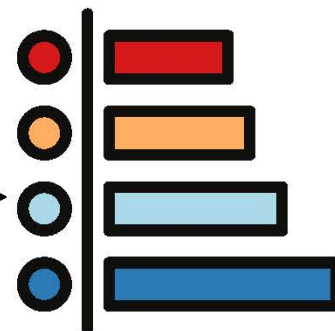
Test Data

Accuracy = 96.8%

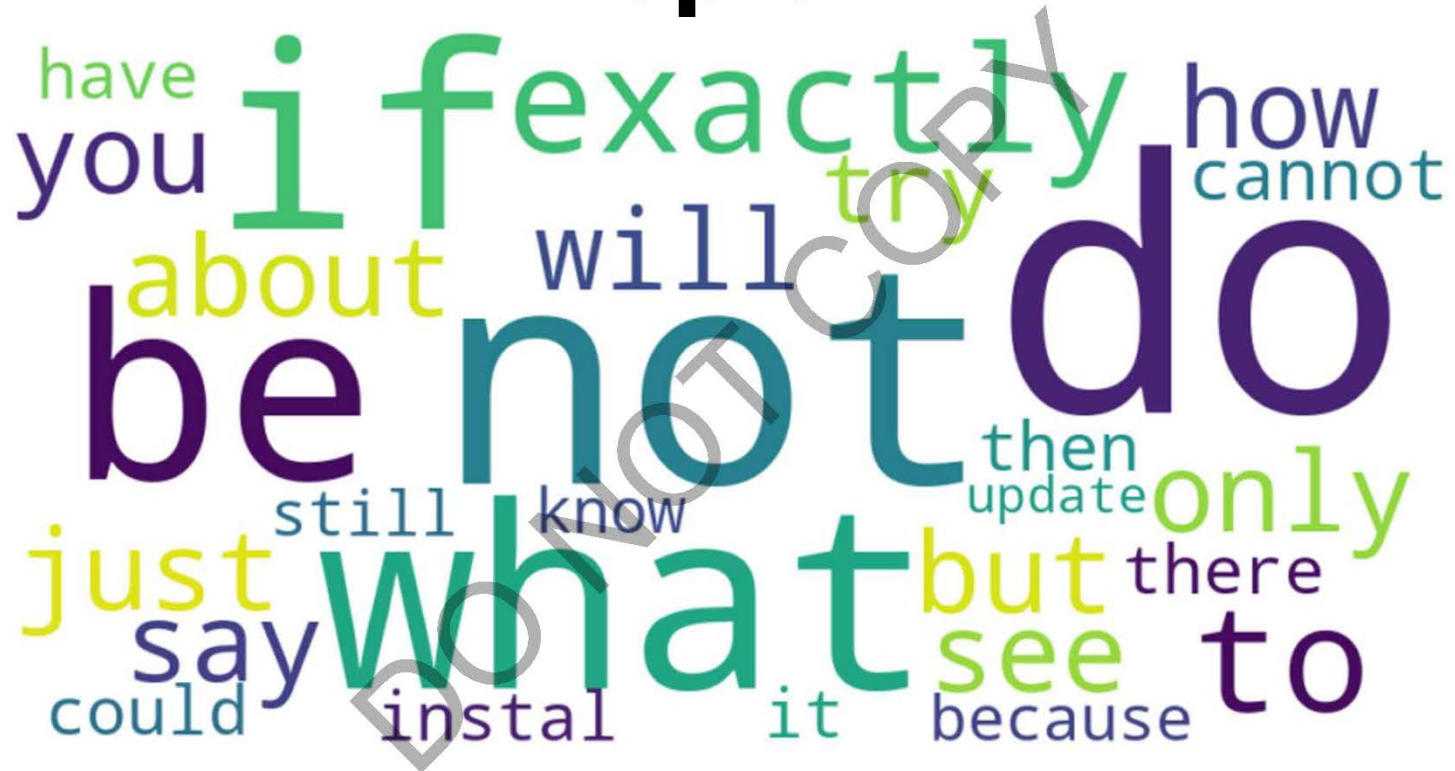
	Precision	Recall
True 0 [Neg Review]	88%	63%
True 1 [Pos Review]	97%	99%



Topic Modeling



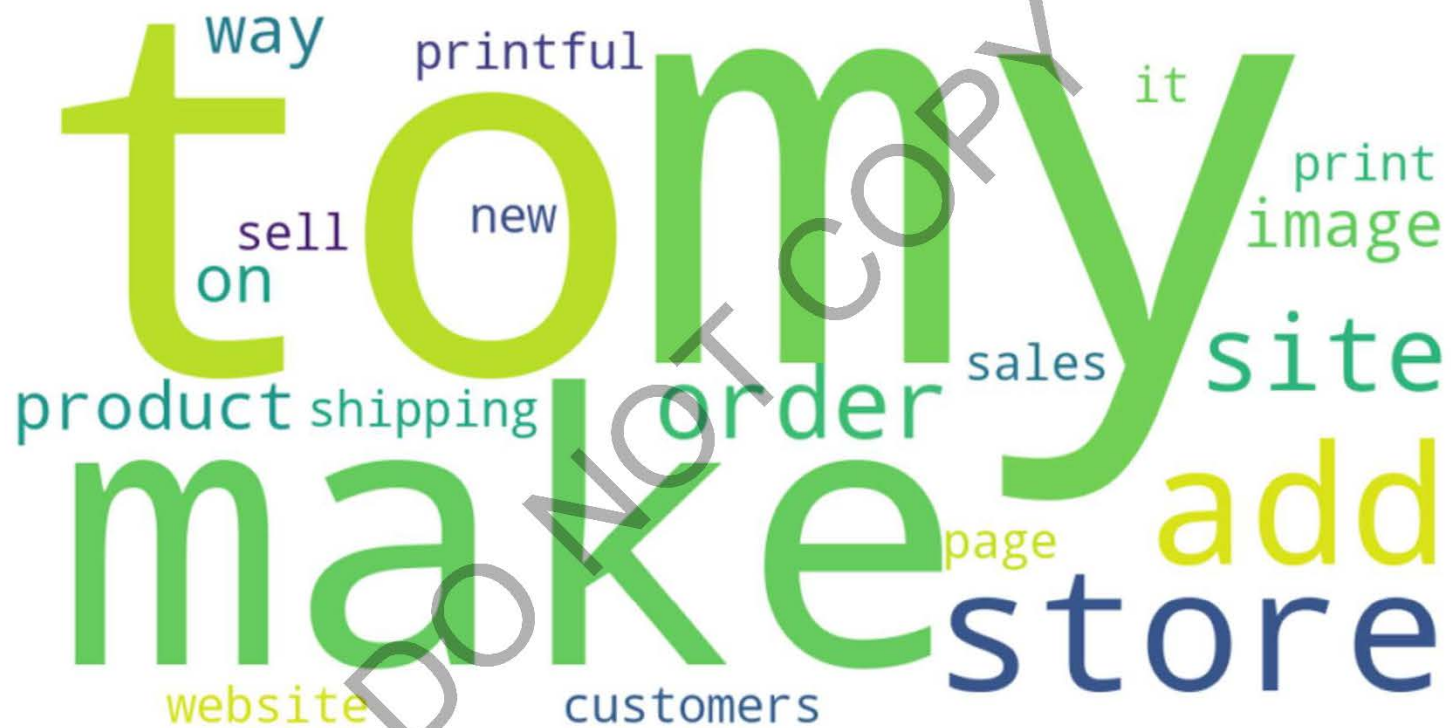
Topic 1



A word cloud for Topic 1, featuring various words in different colors and sizes. The words are arranged in a circular pattern, with some words appearing more frequently than others. The words include: have, you, if, exactly, how, cannot, try, will, about, be, not, do, then, update, only, just, say, what, but, there, see, to, could, instal, it, because.

have
you
if
exactly
how
cannot
try
will
about
be
not
do
then
update
only
just
say
what
but
there
see
to
could
instal
it
because

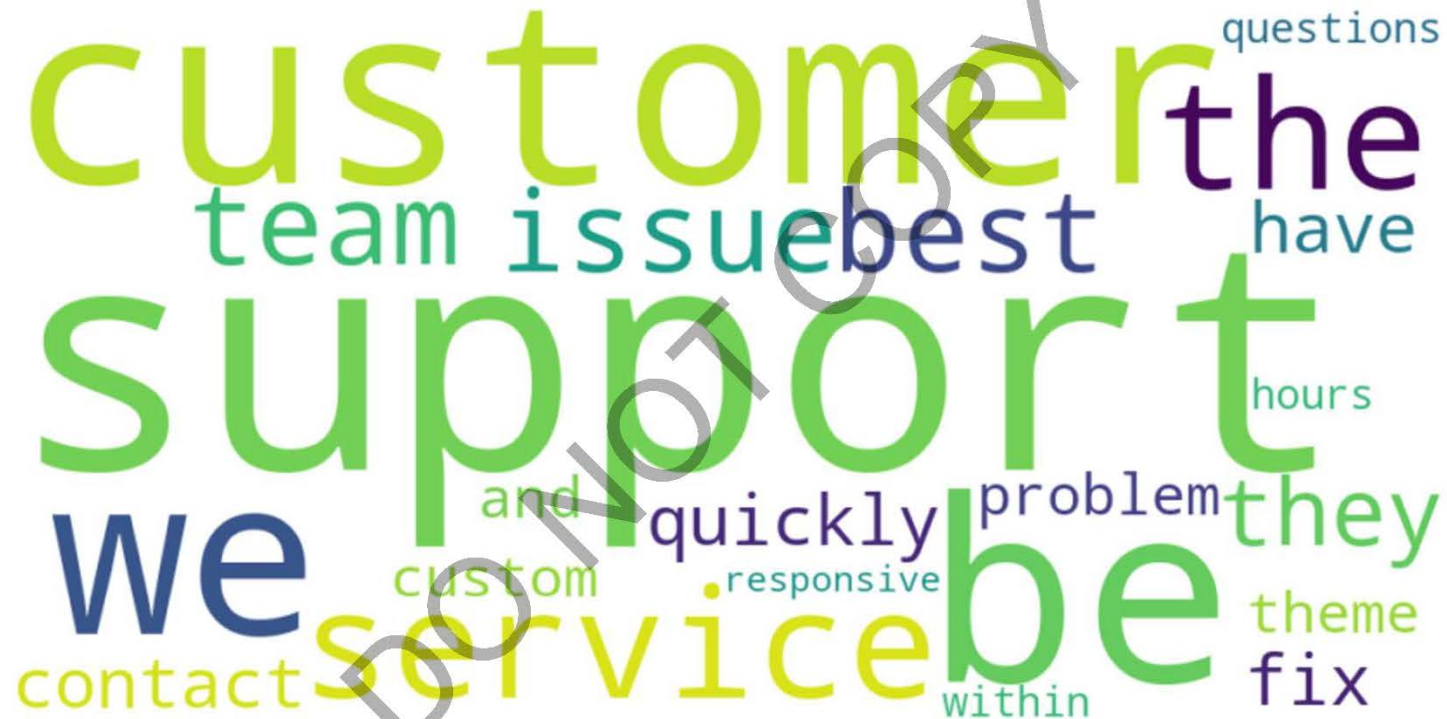
Topic 2



A word cloud visualization for Topic 2. The words are arranged in a cluster, with 'tommy' and 'make' being the largest and most prominent. Other significant words include 'store', 'site', 'add', 'order', 'shipping', 'product', 'new', 'way', 'printful', 'it', 'print', 'image', 'sales', 'page', 'website', and 'customers'. The words are colored in various shades of green, yellow, and blue. A large, semi-transparent watermark reading 'DO NOT COPY' is overlaid diagonally across the word cloud.

way printful it
tommy
sell on new
product shipping order sales site
make page add
website customers store

Topic 3



A word cloud visualization for Topic 3, centered around customer support. The words are arranged in a circular pattern, with the most prominent words being 'customer', 'support', 'we', 'service', and 'be'. Other visible words include 'team', 'issue', 'best', 'the', 'have', 'questions', 'hours', 'they', 'problem', 'quickly', 'responsive', 'custom', 'and', 'contact', 'within', 'theme', and 'fix'. The colors of the words range from light green to dark blue.

customer the
team issue best have
support hours
we and quickly problem they
service responsive be theme
contact within fix

Topic 4

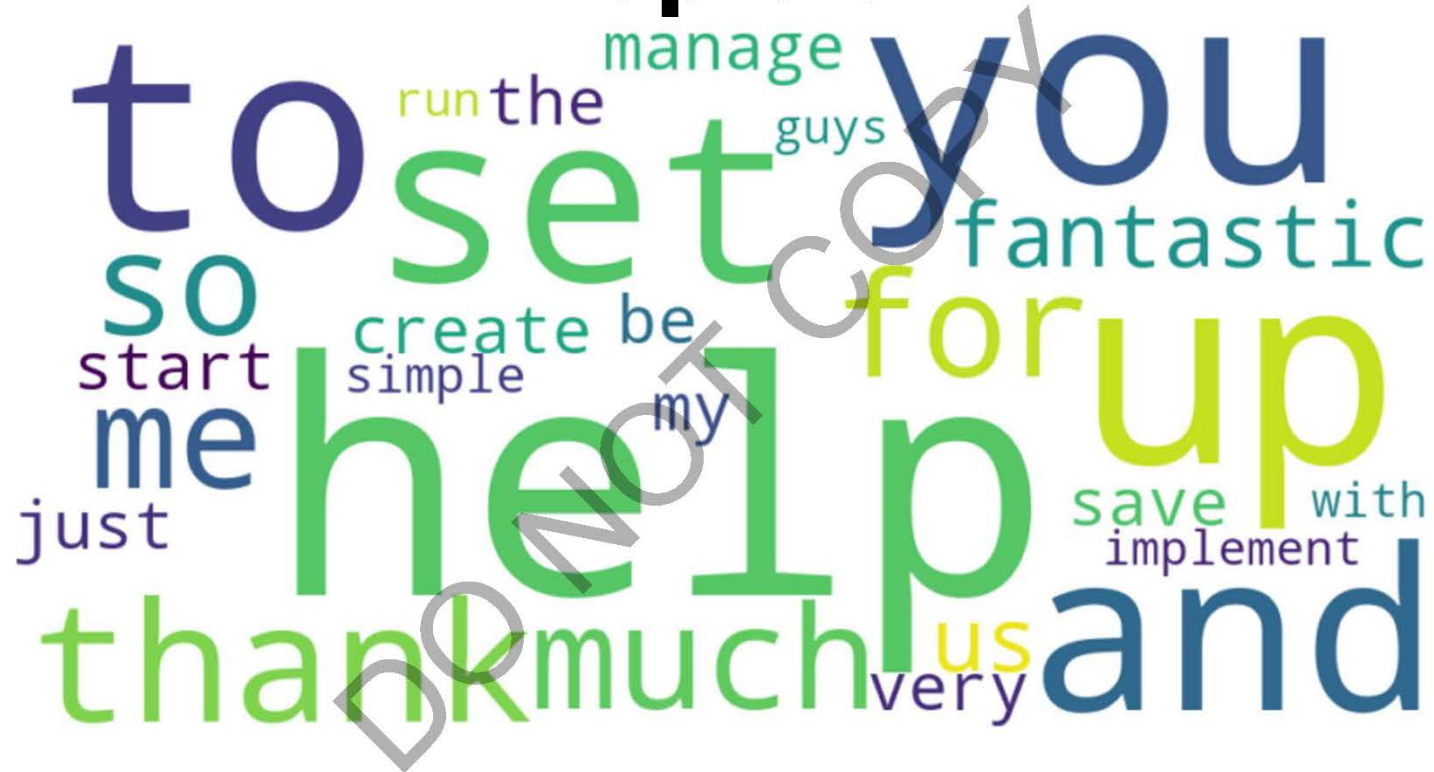


A word cloud visualization of user feedback for Topic 4. The words are arranged in a circular pattern, with the most prominent words in the center and smaller words towards the edges. The colors of the words vary, including shades of green, blue, purple, and yellow. A large, faint watermark reading 'COPY' is visible across the center of the word cloud.

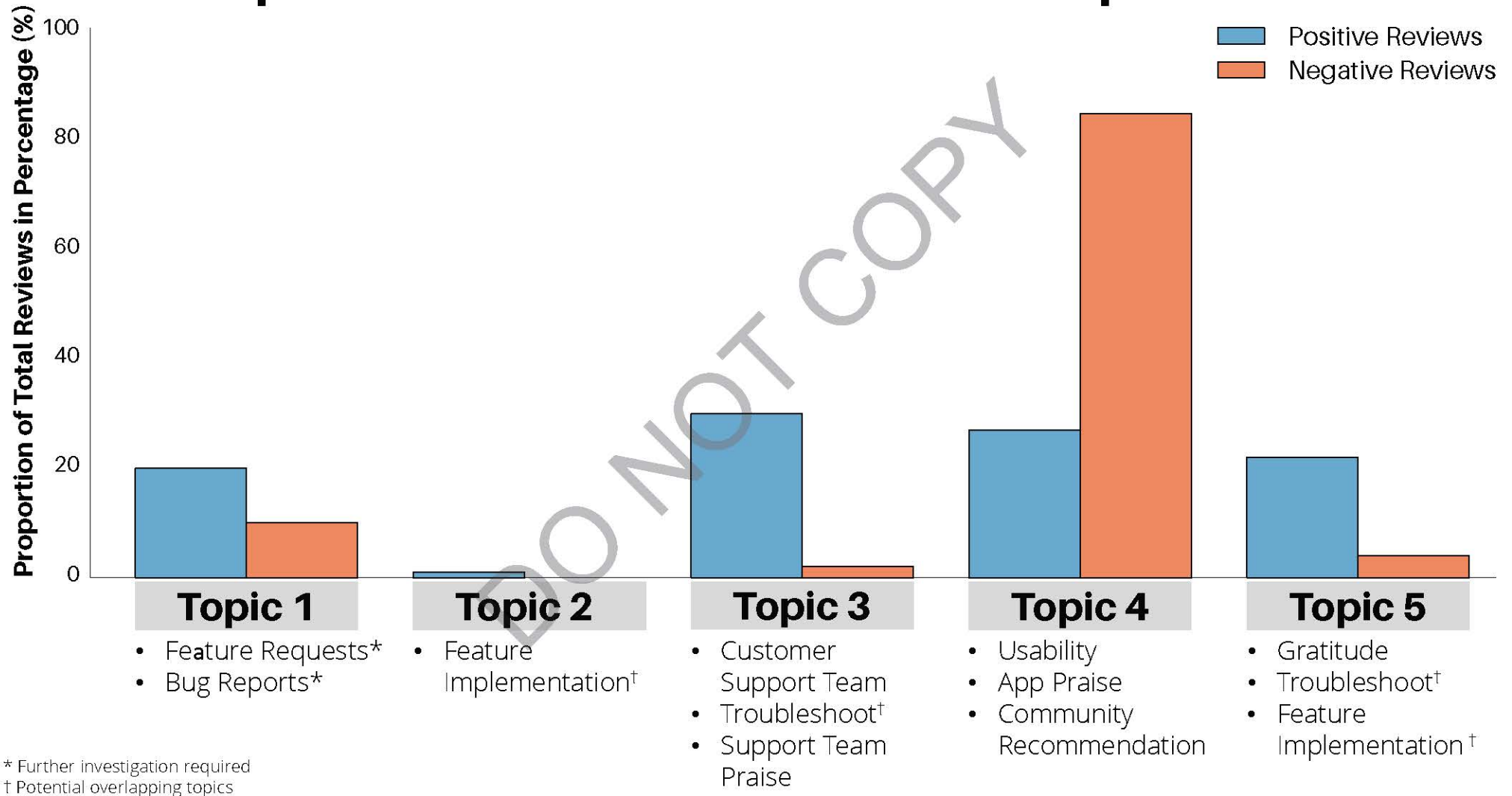
recommend app
would useful this simple works
it
love highly
nice be
good helpful
great and friendly install
easy
very
to
use

Topic 5

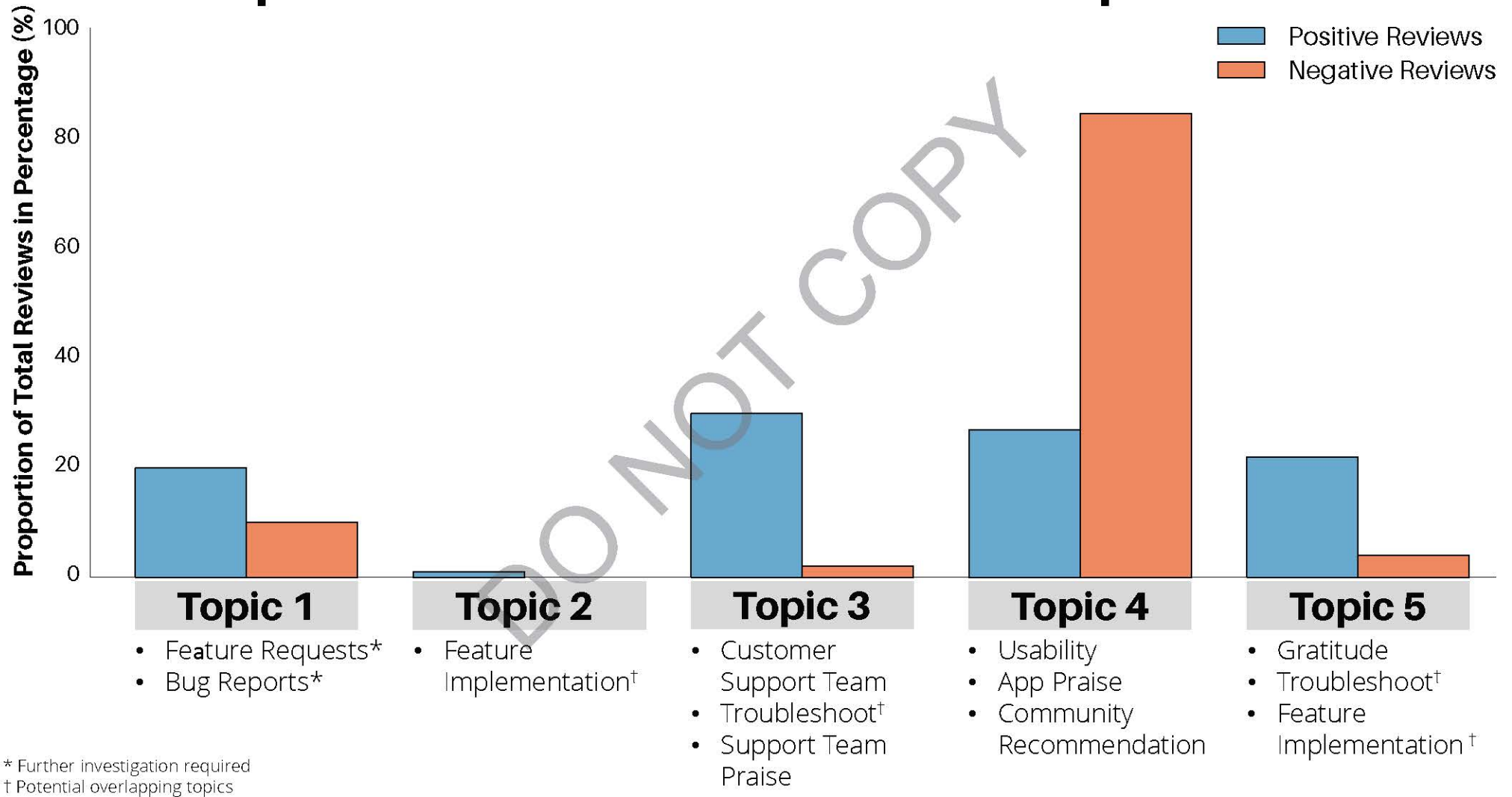
to set you
so fantastic
start simple create be my for up
me just help and
thank much us very

A word cloud for Topic 5. The words are arranged in a circular pattern. The largest words are 'to', 'set', 'you', 'help', 'and', 'fantastic', 'for', 'up', 'thank', 'much', 'me', 'start', 'simple', 'create', 'be', 'my', 'just', 'us', 'very', 'save', 'with', 'implement', 'guys', 'run', 'the', 'manage'. The words are in various colors including blue, green, yellow, and purple. A large, faint watermark 'NOT COPY' is visible across the center of the word cloud.

Compilation of Reviews and Dominant Topic



Compilation of Reviews and Dominant Topic



Insights and Recommendations

- Positive Review Predictors
 - Support Team, Usability, Praise, Recommendation, Gratitude
- Negative Review Predictors
 - Usability, Recommendation
- Output Format
 - Interactive Dashboard or Summary Report
- Mandatory Field in App Store Review
 - Users Select Pre-populated Topics

Future Directions

- Data-Centric Approach
 - Optimize Text-Preprocessing
 - Spellcheck, Tense, Custom Stopword List
 - Text Normalization Iteratively
- Model-Centric Approach
 - Optimize Hyperparameters
 - Topic Coherence Score

Future Directions

- Robust Classification of Topics
 - Domain Expert Interviews
 - Previous Literature
- Expand Communication Channel

T **H** **A** **N** **K**
Y **O** **U**