

Word of Mouth

Using NLP and Twitter to
measure Market Reach

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Social Media is Modern Word of Mouth

- Are people talking about your product?
- What are they saying?
- Bad word of mouth can be worse than none at all



Two Objectives

1. Identify products in tweets
2. Measure sentiment (positive, negative, neutral)



1. Natural Language Processing

Turning Words into Numbers



Twitter is Filled with Noise

- Tweets can be in any language with random symbols
- Hashtags or no Hashtags?
- Does sentence structure matter?

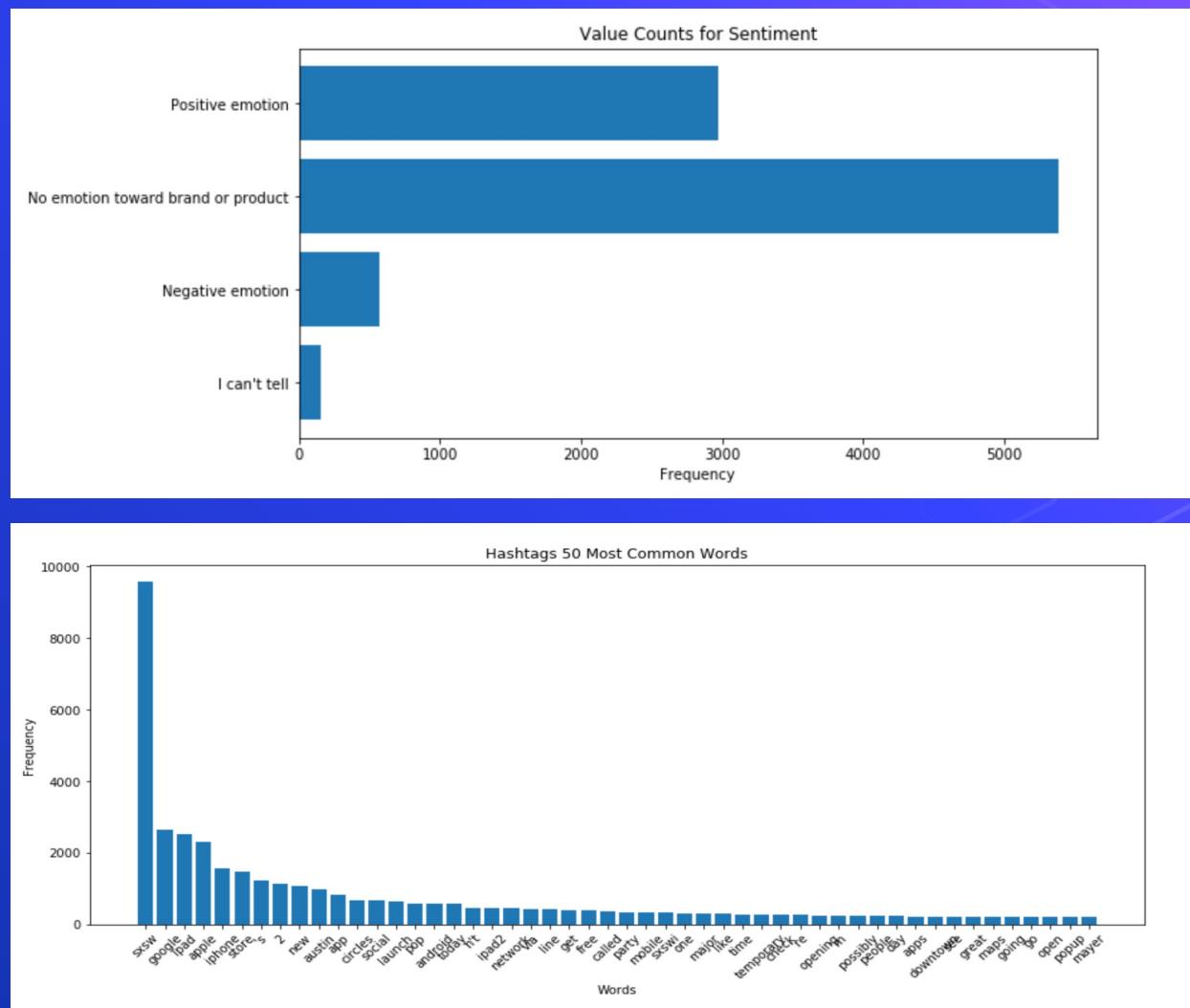


2.

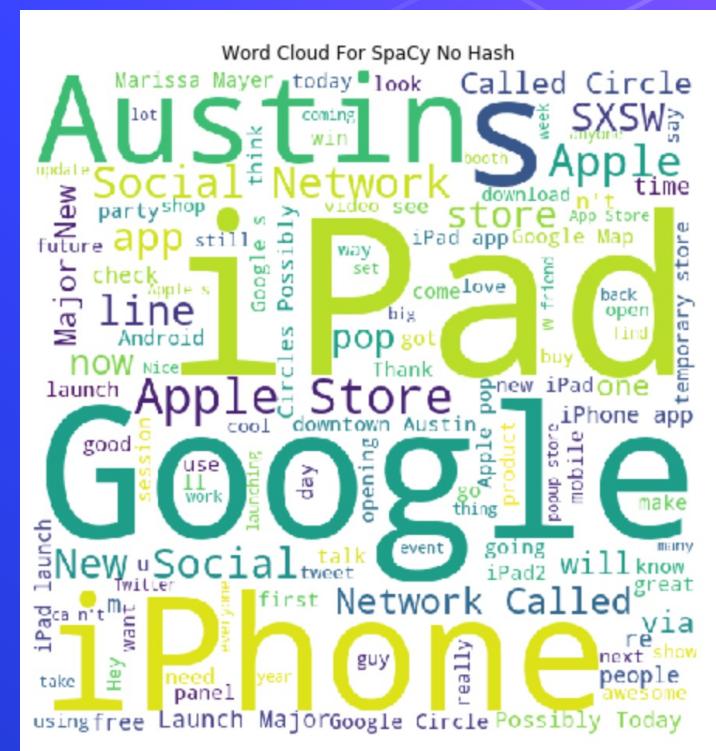
The Data

9000 Tweets from SXSW





Multiple Processing Methods



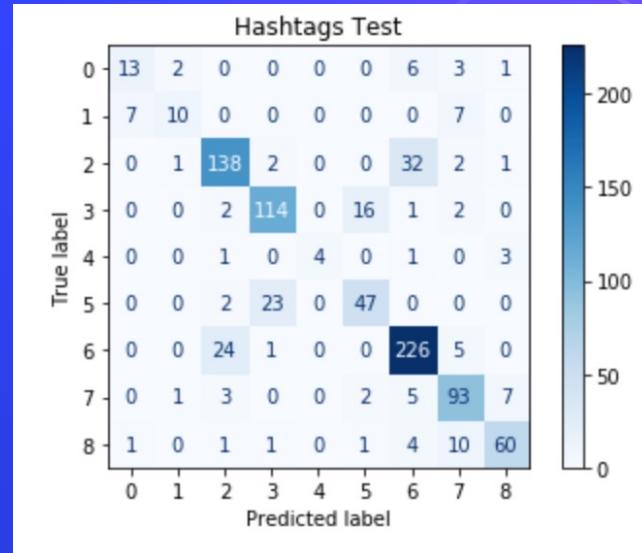
3. Identify Products

9 options – Blind Guess would be 29%
accurate

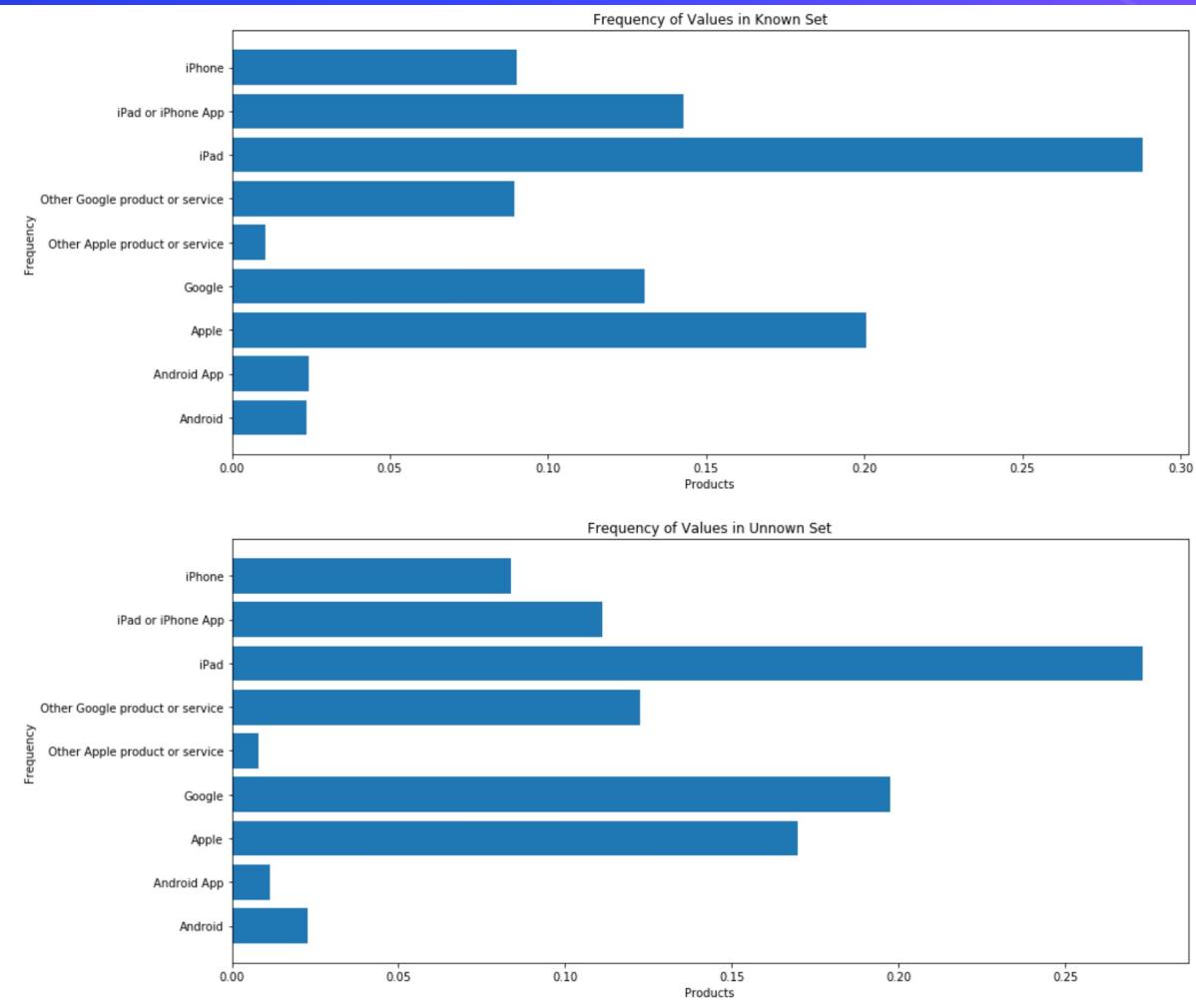


Best Model – Support Vector Machine

- Had 79% accuracy
- TF-IDF most effective vectorization method
- Hashtags are important! But no hashtags performed well too.



	Hashtags Holdout	No Hashtags Holdout	SpaCy No Hash Holdout	SpaCy w/ Hash Holdout
Accuracy	0.790274	0.762918	0.553191	0.568389
Precision (Macro)	0.670259	0.798291	0.478789	0.482382
Recall (Macro)	0.622199	0.644147	0.406134	0.416626
F1 (Macro)	0.636079	0.689766	0.42183	0.432327



4.

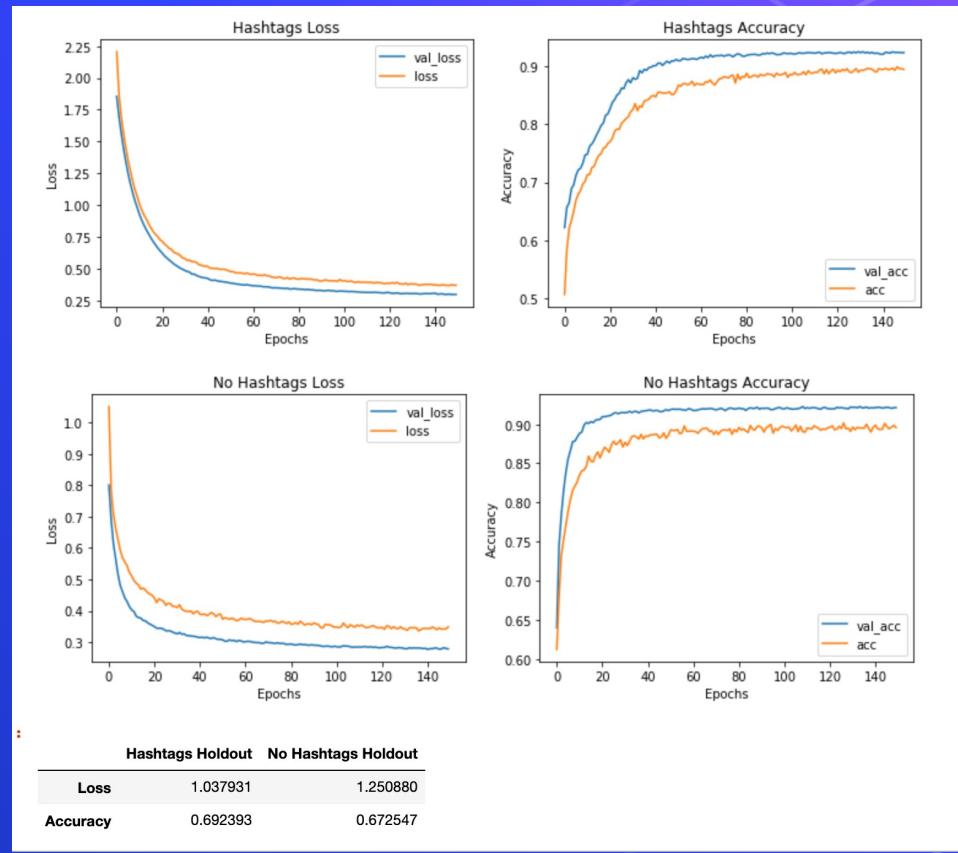
Sentiment Analysis

3 options – Blind Guess would be 60% accurate



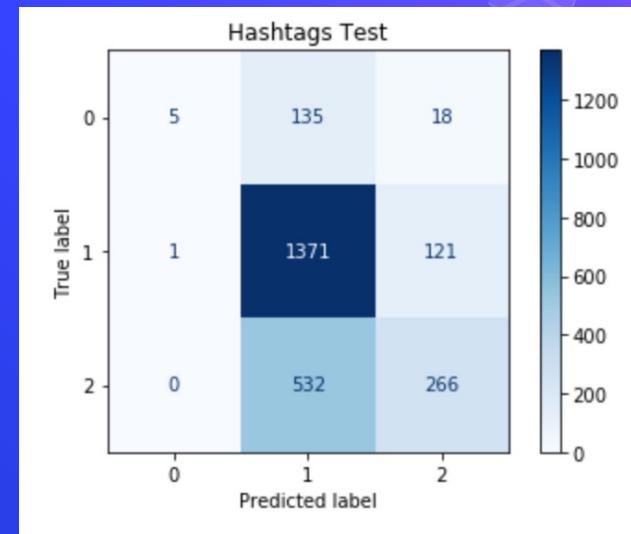
Best Model - Neural Network

- Not the fastest training algorithm but had 69.2% accuracy
- Underfit model performed better on test data
- Hashtags are important again!



Second Best Model - SVM

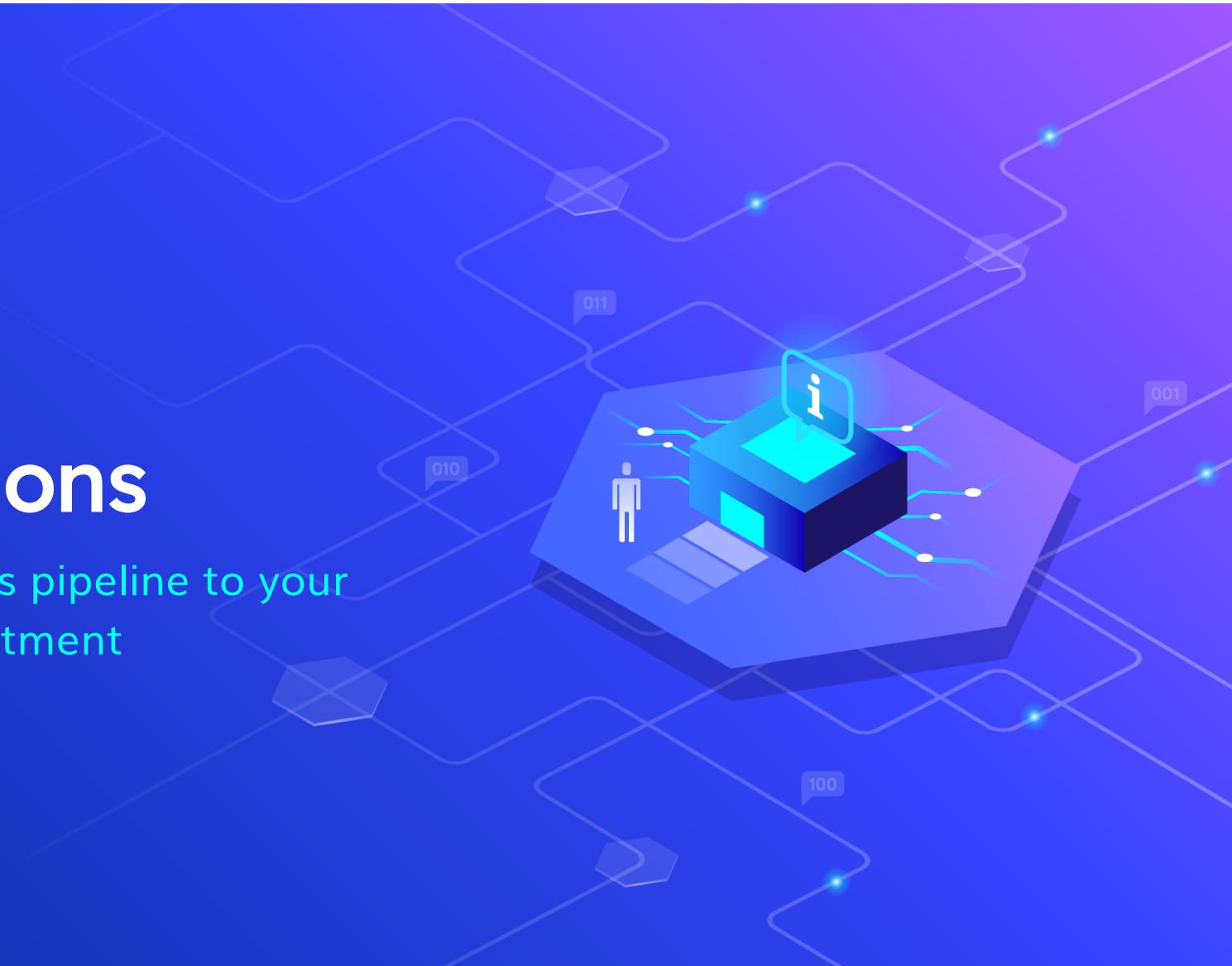
- Had 69.1% accuracy
- Most frequently mistook a positive tweet as a neutral tweet
- Hashtags are important again!
- TF-IDF is best



	Hashtags Holdout	SpaCy No Hash Holdout	SpaCy w/ Hash Holdout	No Hashtags Holdout
Accuracy	0.69129	0.67806	0.687982	0.68688
Precision (Macro)	0.780238	0.430235	0.775357	0.611137
Recall (Macro)	0.438065	0.418686	0.430432	0.434494
F1 (Macro)	0.442035	0.409917	0.428391	0.437919

5. Conclusions

How to apply this pipeline to your
marketing department



KPIs + Lead Indicators



This Pipeline can be used for:

Market Penetration KPIs

It's possible to measure changes in mention frequency and sentiment towards products

Community Engagement

Increase the efficiency of response to consumers when sentiment turns negative and retain more customers

Lead Indicators

Measuring word of mouth can be used to predict revenue on new product launches and updates



Next Steps

- Train on more data including tweets with no products
- Explore other forms of social media using the same vectorization methods
- Create training data pipeline (could be costly)
- Only useful for large consumer brands, not niche



Thank You!

Any questions?

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