



Tweets @ Apple Support

Exploring topics from tweet conversations and
predicting the topic based on a user's initial tweet

Text Data

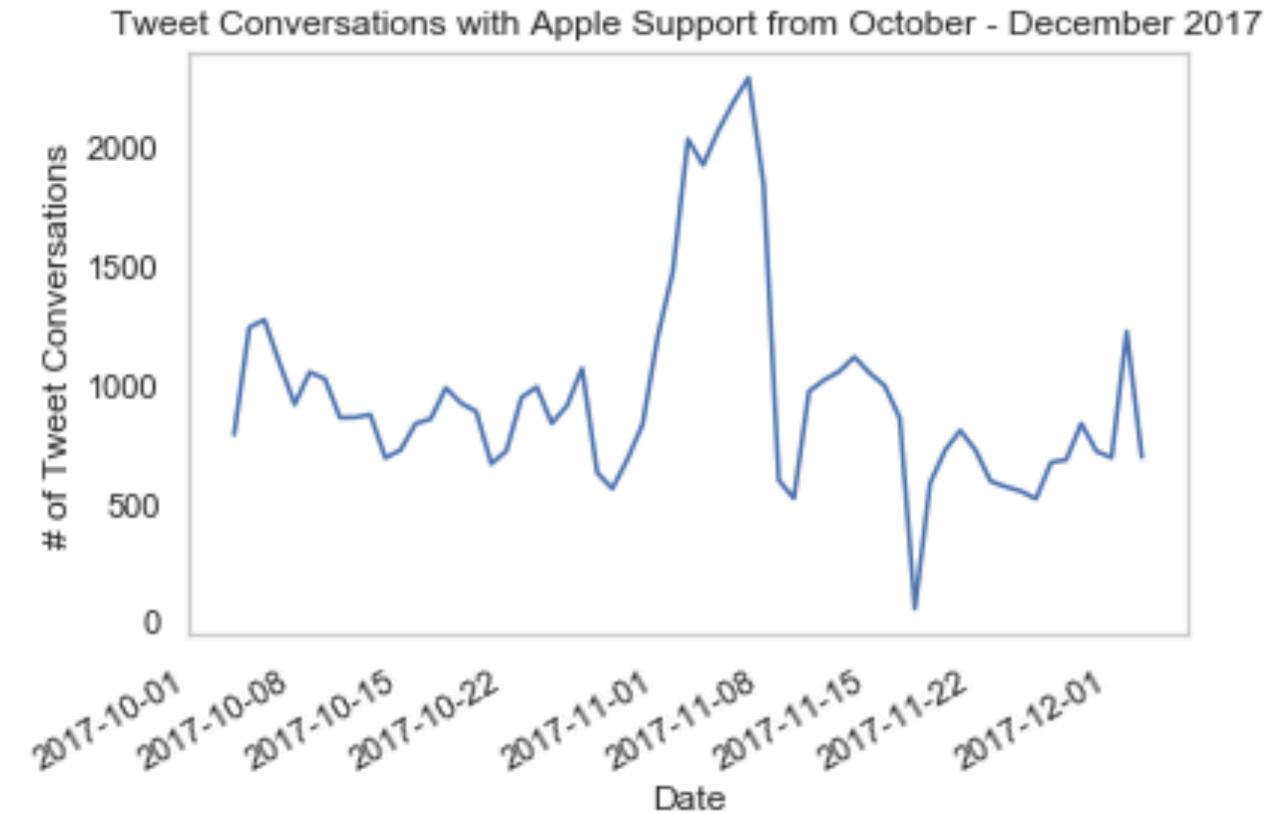
- ~100,000 tweets @ Apple Support from Oct-Dec 2017 (Kaggle)
- Includes tweets + tweet replies
- Stored in MongoDB

Sample tweets from a user:

- "*@AppleSupport why can't I check for an iOS update? #iphone7*" [2017-11-08 06:38:24]
- "*@AppleSupport Ok, I'm going to restart it now*" [2017-11-08 07:10:02]
- "*@AppleSupport I see it now...thanks!*" [2017-11-08 07:15:34]

Text Preprocessing

- Aggregate tweets + replies into **single conversation** (document) by user
- (NLTK) Lemmatization, stop words, punctuation, lengthened words, emoji
- TF-IDF vectorizer
 - Max_df = 0.10
 - Min_df = 0.001
 - Unigram, Bigram, Trigram



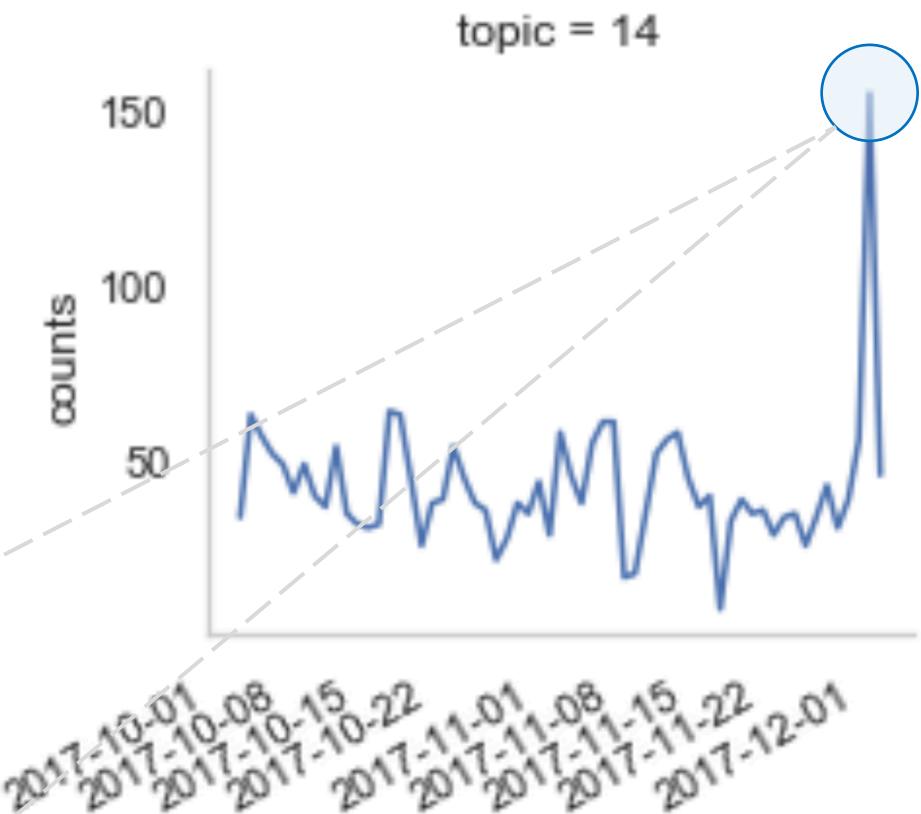
NMF Model

25 Topics in total – some highlights:

- Topic 14: screen, lock, lock screen, black, home
- Topic 16: email, account, id, received
- Topic 2: letter, type letter, eye, letter eye, use
- Topic 1: battery, life, battery life, drain, battery drain

"@AppleSupport What everyone else is saying. 11.1.2 iPhone X constantly goes to black screen with spinner..."

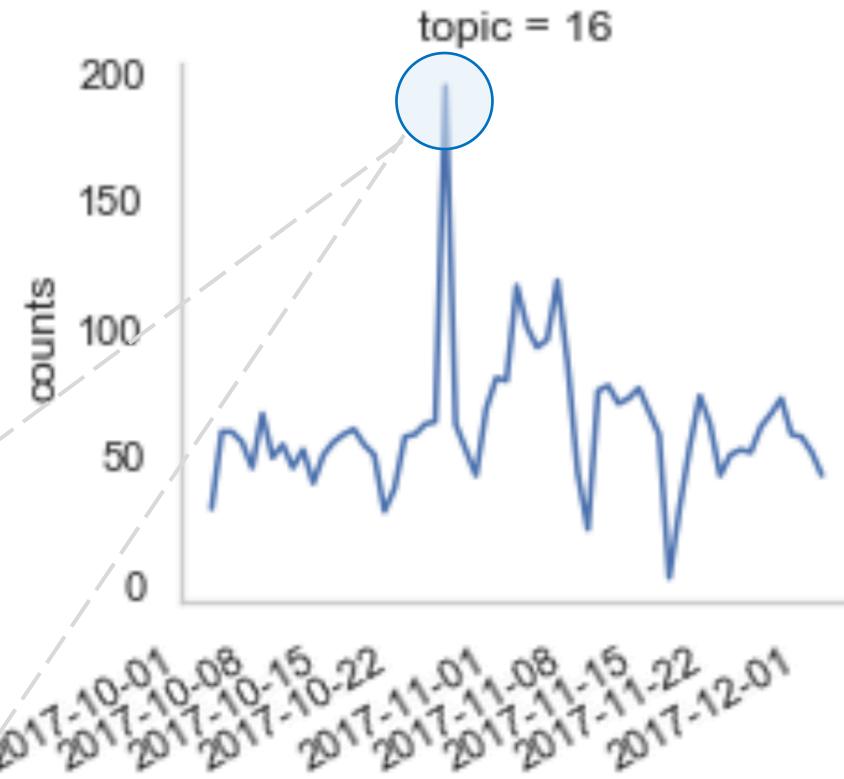
"@AppleSupport Hi, is there any fix to the issue with black screen and phone constantly restarting? iPhone X, iOS 11.1.2..."



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"@AppleSupport Just preordered the iPhone X and was told an email will be sent. When should I expect to receive the reservation email?..."

"@AppleSupport I preordered the iPhone X through the upgrade program but never received an email confirmation/don't see my order in my acct..."

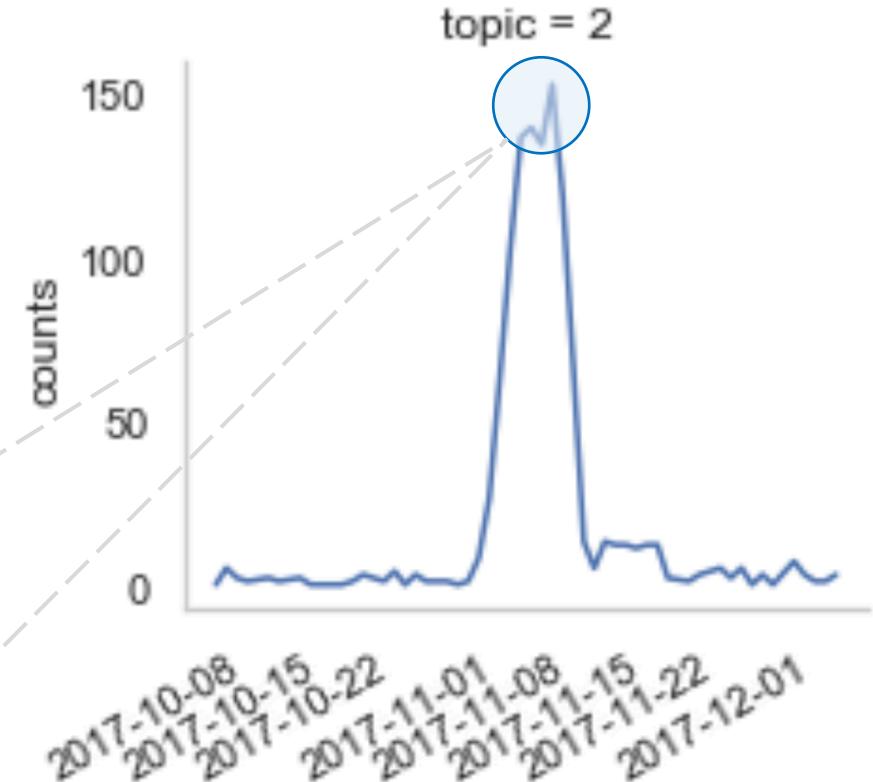
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"@AppleSupport, why is my phone now autocorrecting "I" to
jibberish? Please help..."

"@AppleSupport can you guys fix the "I" letter pls?..."



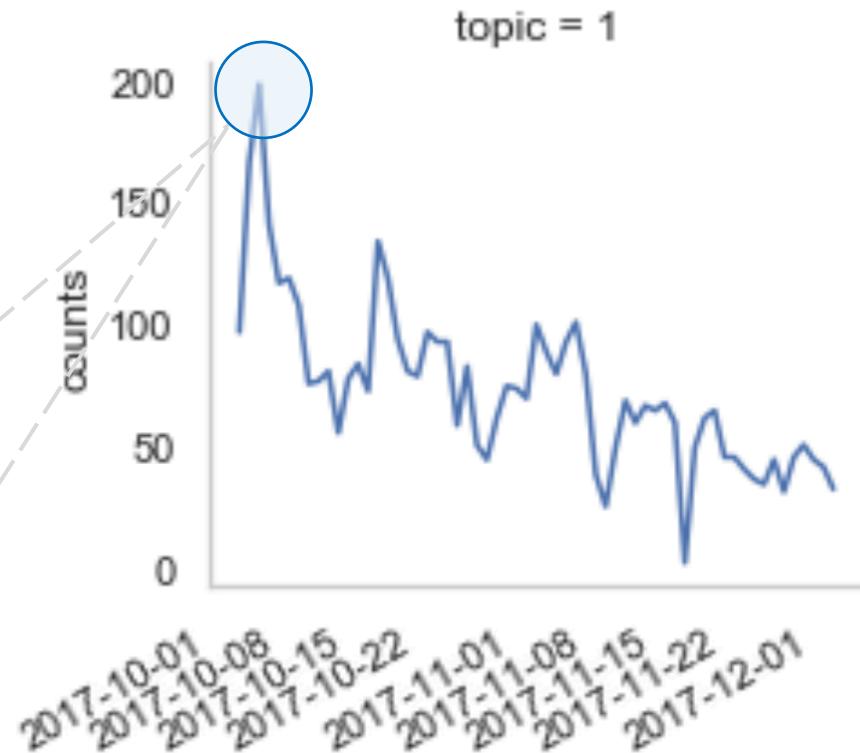
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- **Topic 1:** **battery, life, battery life, drain, battery drain**

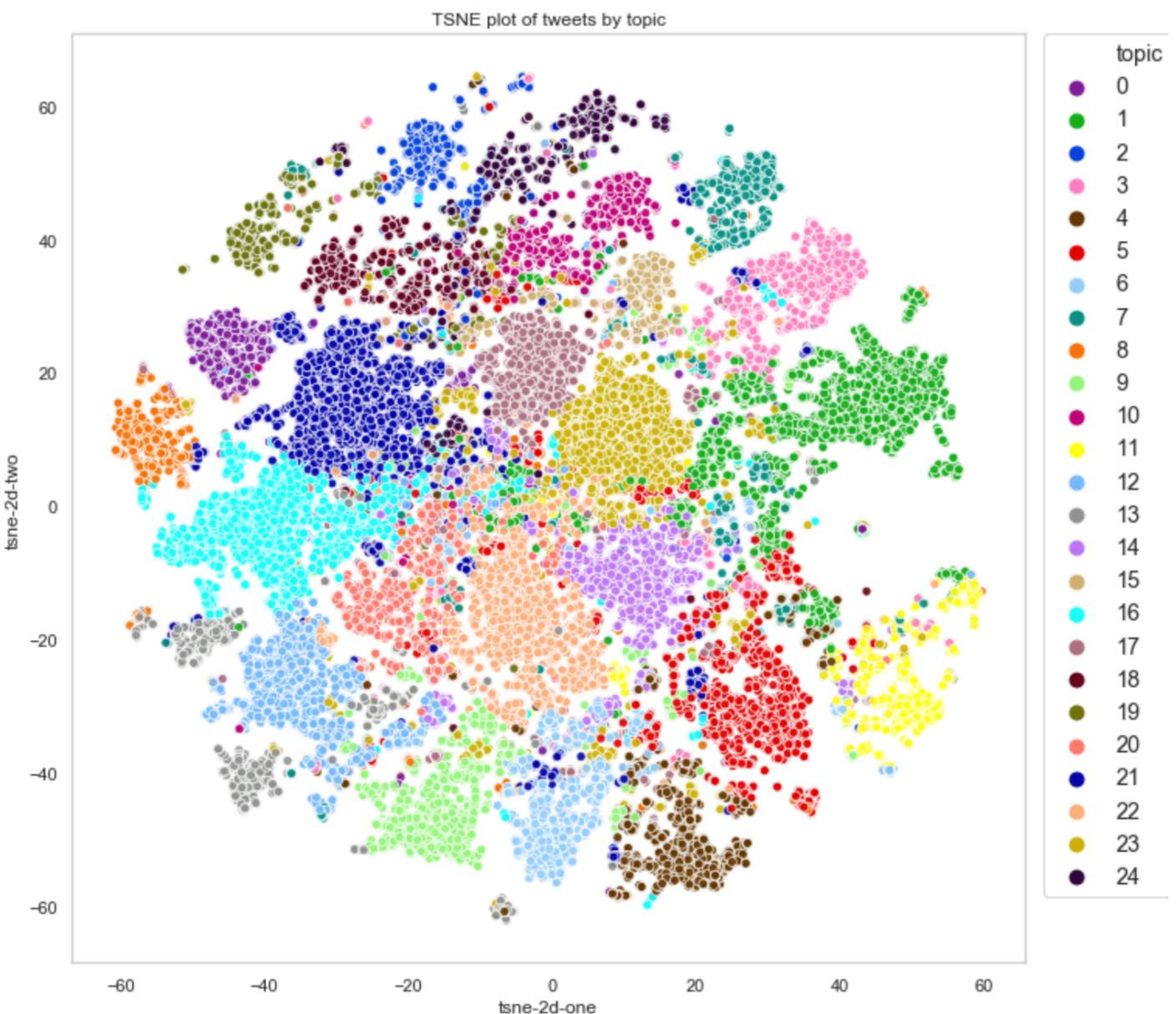
*"Can @AppleSupport help me in checking my iphone
battery life..."*

*"hey @AppleSupport - my iphone battery is dropping to
single digits within 3 hours of being charged. Can you help
figure out why?..."*

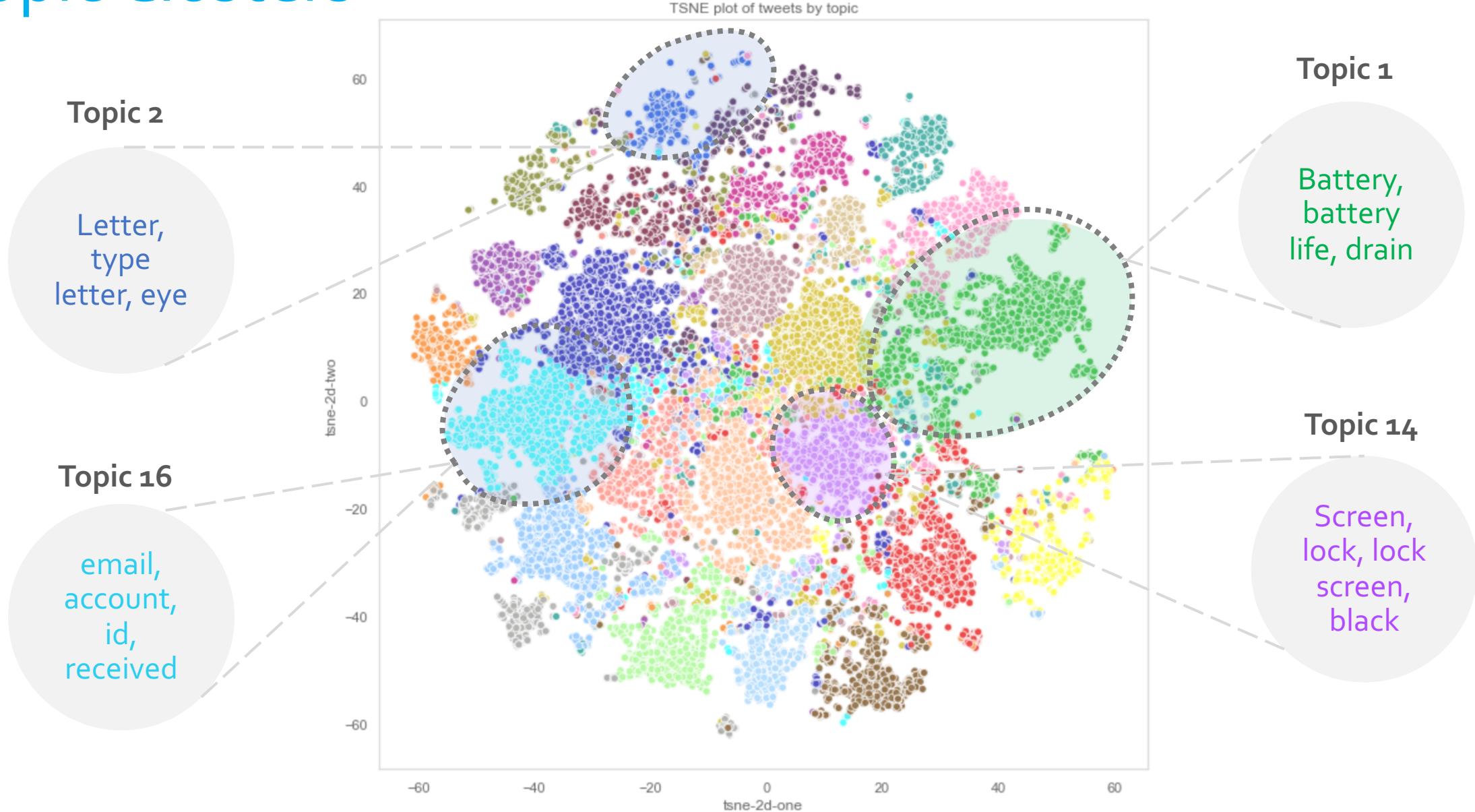


Topic Clusters

t-SNE: Visualize 25 topics in 2D with cosine metric



Topic Clusters



Topic Prediction

Objective:

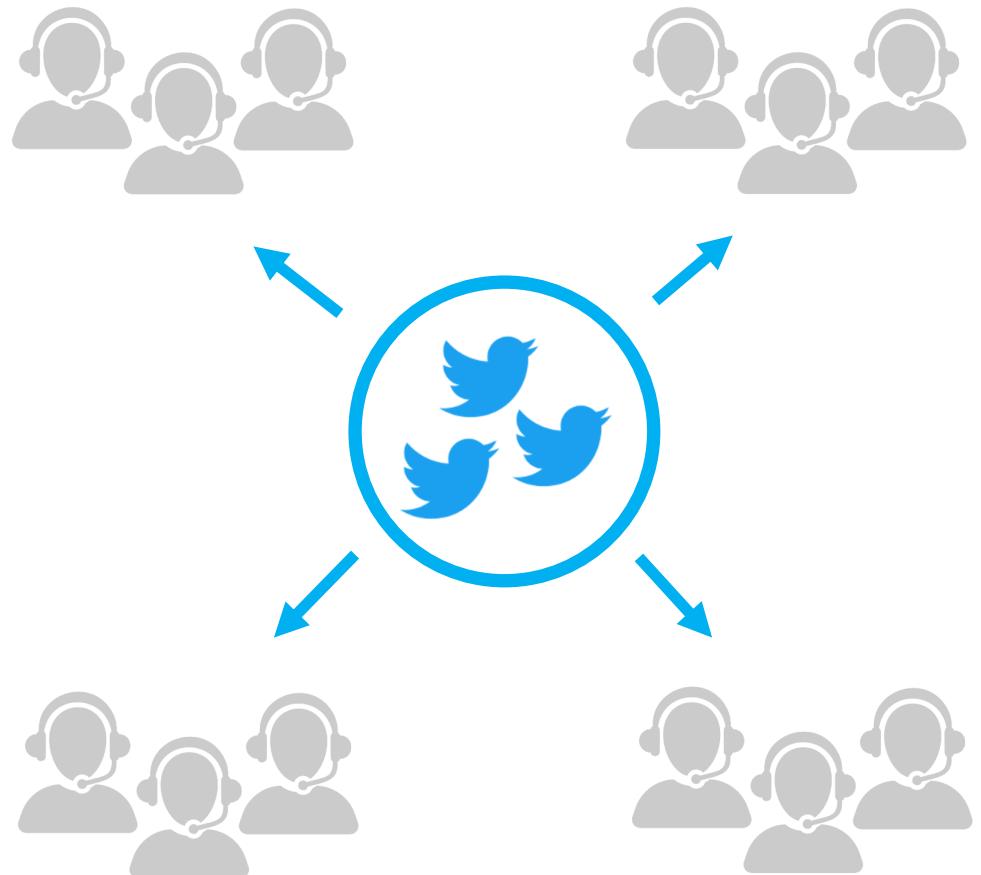
Predicting the support topic by product type based on a user's initial tweet

Applications:

Automatically route tweets to product specialists within the Apple Support team

Problem Type:

Unsupervised classification (no labels)





Pre-processing:

- Initial tweets only (exclude replies)
- Count vectorized matrix

Anchors (moderate strength):

- iPhone or iOS
- Mac or macOS
- iPad or iPadOS
- Watch or watchOS

CorEx Results

Results:

- Two-thirds of tweets labelled as one of the 4 topics (products)
- Remaining one-third as unlabeled could be routed to customer support **generalists**

Sample Prediction Outcomes

"Any one good with iPhones that can help me with a frustrating issue !? #iphone @AppleSupport"

Topic Predicted: iPhone / iOS

"@AppleSupport My iPad air 1 says it's connected to the Internet but all my apps say no connection"

Topic Predicted: iPad / iPadOS

"@AppleSupport please tell me how to fix this it's driving me nuts"

Topic Predicted: None

Future Considerations

Biterm Topic Model

Language Conversion

Predicting company's responses



@customer Sorry to hear
that. How can we help?



Thank you!