

NATURAL LANGUAGE PROCESSING

Twitter Topic Modeling:
#January6thCommitteeHearing

Client

The Washington Post would like to understand the topics that are trending on Twitter within the January 6th Committee Hearings to get potential story ideas.



Key Questions

The January 6th Committee had a hearing on October 13th 2022

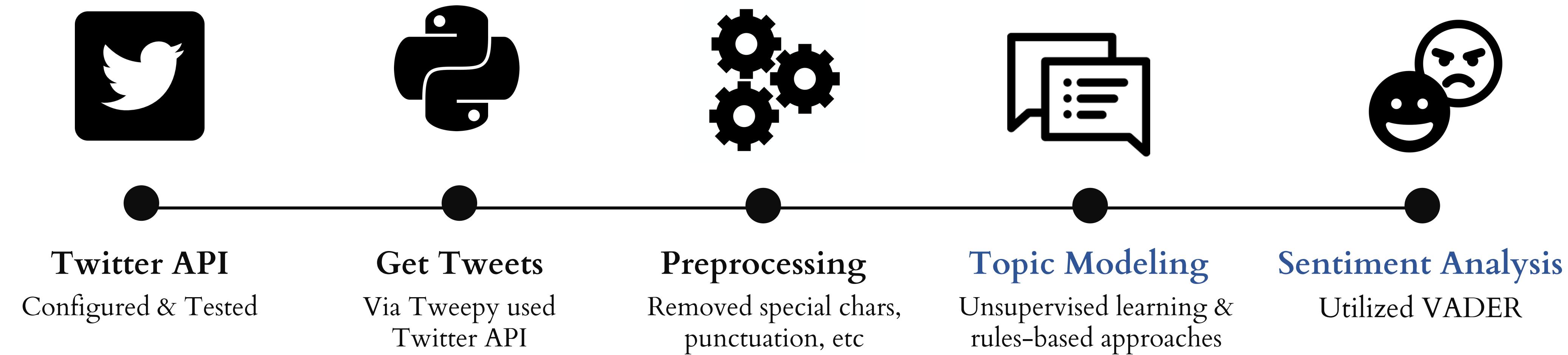
Additional video evidence was presented, and they voted to subpoena Trump.

- 🔑 What topics were most tweeted about during the Oct 13th hearing?
- 🔑 What was the primary topic associated with Trump?
- 🔑 What was the sentiment of the primary topic associated with Trump?



Getting to Answers

35,000 Tweets + Retweets



Topic Modeling

Methodology

Utilize a breadth of algorithms to uncover signals in the data that lead to human-understandable topics

LSA

Matrix Factorization utilizing SVD on the matrix of document terms

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CountVectorizer

- Frequency of words in text
- Considers words that are abundant in corpus as most statistically significant
- Doesn't identify relationships between words

LSA

Matrix Factorization utilizing SVD on the matrix of document terms

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TF-IDF

- Frequency of words in text **AND**
- Inverse Document Frequency downscals words that appear a lot across documents
- Helps in highlighting a word that is frequent in a document but not across documents

LDA

Probabilistic Modeling describes documents by a distribution of word probabilities

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CountVectorizer

- Frequency of words in text
- Considers words that are abundant in corpus as most statistically significant
- Doesn't identify relationships between words

LDA + Bigrams

Probabilistic Modeling & detect common phrases using Gensim's 'Phrases()'

&

Gensim simple_preprocess

- Similar to CountVectorizer but has some additional pre-process techniques to make it easier

Compare Topic Terms by Algorithm

To see how the algorithms perform amongst each other, and see trends that can guide
human naming of the topic groups

Algorithm	Topic 1 Terms	Topic 2 Terms	Topic 3 Terms	Topic 4 Terms

Compare Topic Terms by Algorithm

Matrix Factorization

Algorithm	Topic 1 Terms	Topic 2 Terms	Topic 3 Terms	Topic 4 Terms
LSA with CountVectorizer	trump, knew, responsible, called mcconnell, mccarthy, mitch kevin	trump, violence, democracy, mark attack, decided summoned, excuse	mark, democracy, gop, country maga, without, love, overthrowing	lost, stone, roger, video help, coup yet, new
LSA with TF-IDF	kevin, backed, mccarthy, mitch, mcconnell, responsible, called knew	mark, democracy, violence, Hamill Creating, correct, overthrowing, love	decided, hatch, rudy, giuliani meadows, lost, yet, stone	demands, oath, unanimously, deserves history, voted, subpoena

Probabilistic Modeling

Algorithm	Topic 1 Terms	Topic 2 Terms	Topic 3 Terms	Topic 4 Terms
LDA	knew, trump, pelosi, amp today, like, still, fbi	trump, knew, responsible, mcconnell called, mitch, backed, mccarthy, kevin	trump, maga, chris, thing national, miller, person, acting	Trump, lost, decided, attack, Coup, help, video, new
LDA with Bigrams	knew, trump, democracy, lost American_people, break, trump_tried, accept	trump, subpoena_donald, testify, voted_unanimously demands, oath_democracy, history_deserves	trump, roger_stone, trump_lost, help yet, mark_meadows, decided, rudy_giuliani	called, mitch_mcconnell, knew_trump, responsible kevin_mccarthy, backed, thing

Algorithm Terms

trump, knew, responsible, called
mcconnell, mccarthy, mitch kevin

 **Adam Kinzinger #fella** @AdamKinzinger · Oct 13 · 
Mitch McConnell.
Kevin McCarthy.
They both knew Trump was **responsible**.
They both **called** him out.
They both backed down.
That's cowardice - not leadership.
#January6thCommitteeHearings

1,752 9,771 47.9K

 **bill cochrane** @CochraneBill · Oct 14
Replying to @GOPLeader
Mitch McConnell.
Kevin McCarthy.
They both knew Trump was **responsible**.
They both **called** him out.
They both backed down.
That's cowardice - not leadership.

1 2 1

 **Irfan Khan** @IrfanEmmaJordan · Oct 14
Replying to @bennyjohnson
Mitch McConnell & Kevin McCarthy.
They both knew Trump was **responsible**.
They both **called** him out initially.
They both backed down.
That's cowardice - not leadership.

1 2 1

trump, violence,
democracy, mark

mark, democracy,
gop, country

 **john d wrobel** @wrobocop01 · Oct 14
Replying to @Resist_MAGA_GOP
I wish we all followed **Mark Hamill**'s example of standing up for democracy or we may lose it!!

 **TheDeane** @TheDeane79 · Oct 13
Replying to @Resist_MAGA_GOP
Mark Hamill is an intolerable douche.

 **Serious Trickster** @EvolutionGlobe · Oct 14
Replying to @Resist_MAGA_GOP
Mark Hamill hasn't been correct, or right in the head, for years. He thinks he's part of the resistance but he fully supports the empire.

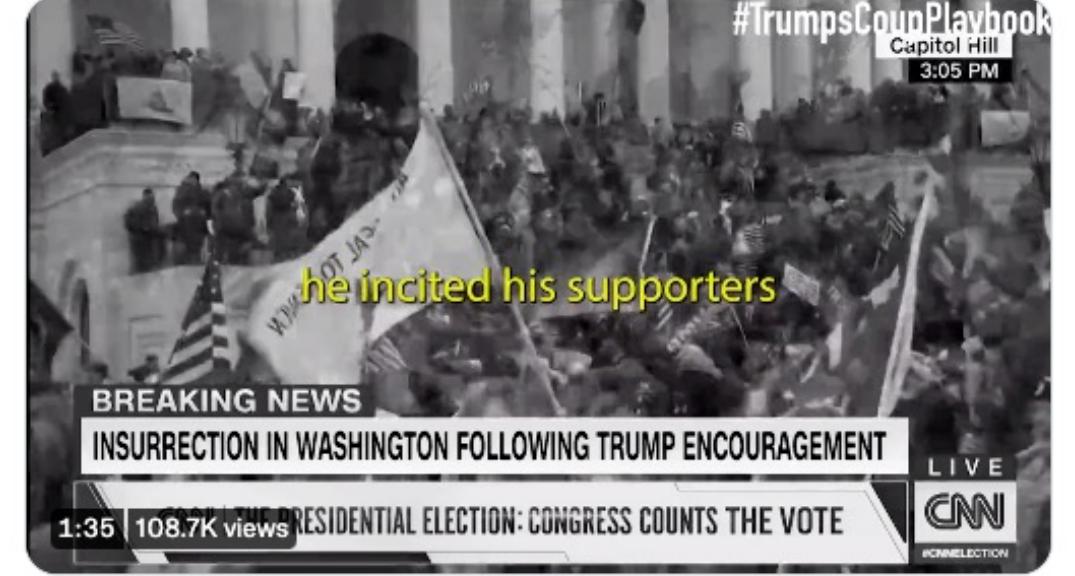
 **GOP Traitors to Democracy** @Resist_MAGA_GOP · Oct 13
Mark Hamill is correct. You can love this country without creating violence by overthrowing democracy. **#January6thCommitteeHearings #HATH**

 "PEOPLE COMPLAINING ABOUT MY ANTI-TRUMP TWEETS NEED TO UNDERSTAND: I LOVE MY COUNTRY AND I FEEL IT'S MY DUTY TO OPPOSE THIS DEMENTED SOCIOPATH WITH EVERY FIBRE OF MY BEING." - MARK HAMILL

482 2,180 12.8K

decided, hatch, rudy, giuliani
meadows, lost, yet, stone

 **StandForBetter.org** @StandForBetter · Oct 13
NEW Video:
Trump Lost, yet he **decided to hatch** a coup with the help of Mark Meadows, Roger Stone, **Rudy Giuliani**, and others. Liz Cheney lays it out. I am never voting for a Republican.
Retweet this video: **#TrumpsCoupPlaybook**
#January6thCommitteeHearings
#Jan6thHearings

 **#TrumpsCoupPlaybook**
Capitol Hill 3:05 PM
he incited his supporters
BREAKING NEWS
INSURRECTION IN WASHINGTON FOLLOWING TRUMP ENCOURAGEMENT
1:35 108.7K views RESIDENTIAL ELECTION: CONGRESS COUNTS THE VOTE
LIVE CNN

203 2,476 3,826

 **SmarderDanU** @SmarderDanU · Oct 13
RT @StandForBetter:
Trump Lost, yet he **decided to hatch** a coup with the help of Mark Meadows, Roger Stone, **Rudy Giuliani**, & others. Liz Cheney lays it out. Never voting for a Republican
#TrumpsCoupPlaybook
#January6thCommitteeHearings
#Jan6thHearings

 **#TrumpsCoupPlaybook**
2:07 108.7K views and I'll be there with you.
From StandForBetter.org

15 19

Human Named Topics

Mitch + Kevin Knew Trump
Responsible

Mark Hamill for Democracy –
Against Trump

Trump Hatched Coup with Meadows,
Giuliani, Stone

Human Named Topics

Roger Stone Video

Trish @meinmelbourne · Oct 14
The smarmy, nihilistic **Roger Stone**, was shown in a Danish filmmaker's video footage from before the election: "Fuck the voting," Stone laughed, as he walked through an airport."Let's get right to the violence."
@January6thCmte
#TrumpCoupAttempt
#RogerStone



newyorker.com
Donald Trump, January 6th, and the Elusive Search for Accountability
The House-select-committee hearings are over, but will the former President ever be held responsible for the tragedy?

Content Containing Terms

Adam @BrownsObsession · Oct 13
Replying to @CiciBird and @ProjectLincoln
There is a video on YT of **Roger Stone** talking to Alex Jones about creating a constitutional crisis if Trump **lost** the *2016* Election. This was always the plan.

1 1 33

Rima Regas, Blog#42 @Rima_Regas · Oct 13
Replying to @JReinerMD
He knew he **lost**. The video of **Roger Stone** shows what the plan was for contesting an election they knew they wouldn't win. This has nothing to do with narcissism and everything to do with being crooked.

1 1 8

Subpoena Trump

Adam Kinzinger #fella 🐸 @AdamKinzinger · Oct 13
We just voted unanimously to subpoena Donald Trump to testify UNDER OATH.
Democracy demands it.
History deserves it.
#January6thCommitteeHearings



1:21 165.3K views
1,609 2,380 17.2K

floridavoicesforprogress @PROGRESSIVES4FL · Oct 14
browardprogress: RT @amprog: Donald Trump is at the center of the multistep scheme to overturn our election.

Yesterday, @January6thCmte voted unanimously to subpoena Trump to testify under oath. Now, he must answer for his actions.



0:51 1,188 views
From American Progress

The Boston Globe 🐸 @BostonGlobe · Oct 14
The US House select committee investigating the attack on the Capitol unanimously voted to issue a subpoena to former president Donald Trump to testify. But what happens next? What does a subpoena mean?

Here's @JamesPindell's analysis: trib.al/76ZzpLs



150 0:32 1,245 views
6 3 5

Trump Lost Decided Attack

julie brough @juliebrough7 · Oct 14
accept his loss but knew he had **lost**. When you @MSNBC pretend **Trump** didn't lead this **attack** on 1/6 and summon his MAGA army and he continues his seditious **attack** on our country I know you have **decided** you will accept autocracy in America and don't care one bit for our Democracy.

Show this thread

Peter Welch 🐸 @WelchForVT · Oct 13
Today's January 6 committee hearing gave us more evidence of what we already knew: The insurrection was not a spur of the moment event.

It was a planned and orchestrated **attack** on democracy by Donald **Trump** who **decided** months in advance he would declare victory even if he **lost**.

Show this thread

99ermikeb @99ermikeb · Oct 14
Being the mental midget that he is, knowing that he understood he **lost** the election, then **decided** to **attack** our nation's capital, **Trump** still pushing the big lie, even though we know he knows that we know that he knows what the truth is:

Glenn Kirschner 🐸 @glennkirschner2 · Oct 14
Trump's letter responding to being subpoenaed by the J6 committee is powerfully incriminating evidence that will be introduced against him when he's prosecuted. And those who helped him draft it are co-conspirators. #JusticeMatters video dropping later today.

THE PRESIDENTIAL ELECTION OF 2020 WAS RIGGED AND STOLEN!
The same group of Radical Left Democrats who utilized their Majority position in Congress to create the fiction of Russia, Russia, Russia, which ended in No. 1, Impeachment, No. 2, the Mueller Report, which ended in No. 2, Collusion!, Ukraine, Ukraine, Ukraine, the attacks and illegal Spying on my Campaign, and so much more, are the people who created this Committee of highly partisan political Hacks and Thugs whose sole function is to destroy the lives of most hardworking American citizens, who are the ones he has been unkind to during this time of unprecedented numbers. The double standard of the Unselects between what has taken place on the "RIGHT," and what has taken place with Radical Left lawless groups such as Antifa, Black Lives Matter, and others, is startling and will never be acceptable, even to those who will be writing the history of what you have done to America.
This memo is being written to express our anger, disappointment, and complaint that with all of the hundreds of millions of dollars spent, who could come to be a Clinton Witch Hunt, and despite your powerful requests, you have not spent even a moment on examining the massive Election Fraud that took place during the 2020 Presidential Election, and have targeted only those who were, as concerned American Citizens, protesting the Fraud itself. Those who committed the Fraud, thereby having created the Crime of the Century, go

Human Named Topics by Algorithm

Matrix Factorization

Algorithm	Topic Name	Topic Name	Topic Name	Topic Name
LSA with CountVectorizer	Mitch + Kevin Knew	Hamill for Democracy	Hamill for Democracy	Roger Stone Video
	Mitch + Kevin Knew	Hamill for Democracy	Trump Hatched Coup with Meadows, Giuliani, Stone	Subpoena Trump

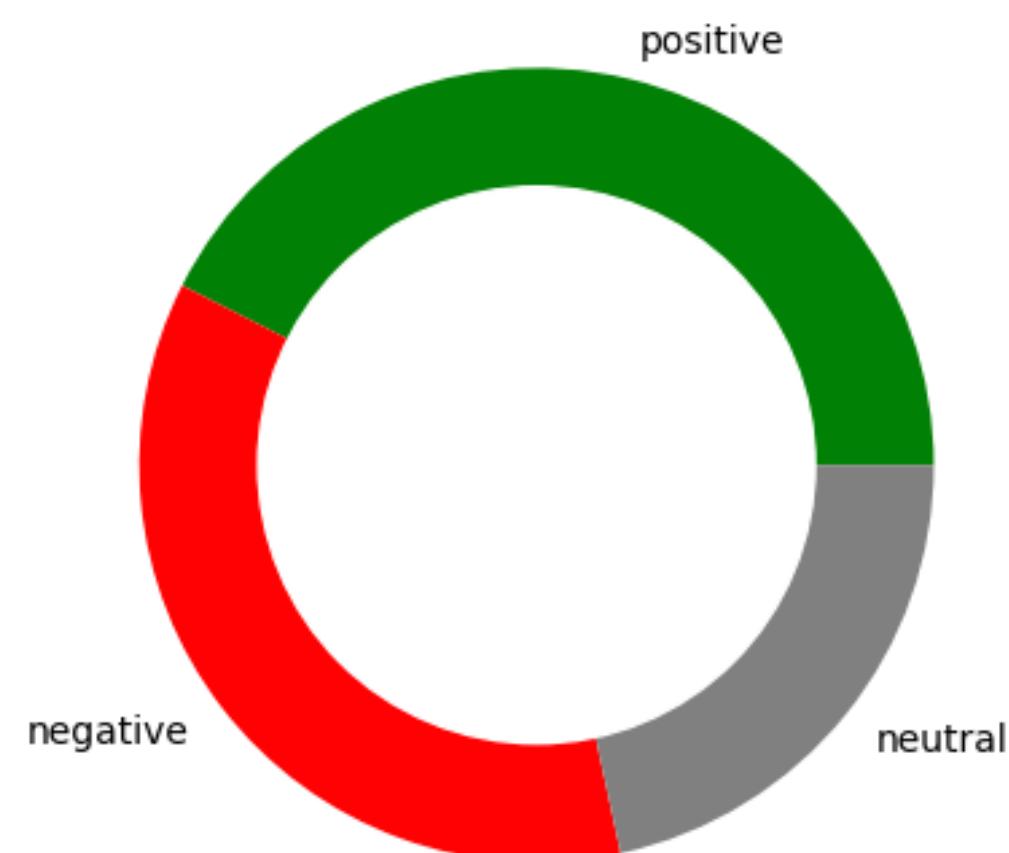
Probabilistic Modeling

Algorithm	Topic Name	Topic Name	Topic Name	Topic Name
LDA	Not Clear Enough	Mitch + Kevin Knew	Not Clear Enough	Trump Lost Decided Attack
	Not Clear Enough	Subpoena Trump	Trump Hatched Coup with Meadows, Giuliani, Stone	Mitch + Kevin Knew

Sentiment

When looking at the entire conversation

Is VADER Sentiment making sense given the context of the conversation?



There's murkiness:

- Seems difficult to be clear about what's negative and positive
- Prompts the question: Is the positive sentiment indicating a positive human conversation?

Tweet	Neg/Pos	Compound Score
TRUMP LOST, KNEW HE LOST! You maga fools are all party to effin Treason	Neg	-0.88
ANGRY ANGRY ANGRY. It's way beyond bourbon	Neg	-0.87
Keep wasting time and money losers January6thCommitteeHearings	Neg	-0.72
Ugh. This shit again	Neg	-0.75
Hoooooooooly shit	Neg	-0.55
Fuck Fox News	Neg	-0.54
Distraction 101	Neg	-0.38
wow wow trumpisgoingtojail capitolriot nancypelos	Pos	0.82
Justice & Peace	Pos	0.78
Stunning. Stunning. Stunning. Stunning	Pos	0.85
Treat Trump like the Rosenbergs	Pos	0.63
GOOD! #January6thCommitteeHearings #Trumpisgoingtoprison	Pos	0.44
Too funny 😂 #January6thCommitteeHearings	Pos	0.44
Interesting	Pos	0.40
Joke	Pos	0.29

Discussion