Twitter Sentiment Analysis of the iPhone X Product Launch

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Motivation

- Our primary motivation was to tell the story of the iPhone X product launch, & narrate a data-driven story of whether the launch was a success or a failure from the perspective of social media analytics
- The story we will tell is that the launch of the iPhone X was a success on social media for Apple from marketing standpoint

Background

- Our data-driven story will detail how we determined whether the product launch was a success: by computing the trend in tweet sentiment of the iPhone X before and after the product launch
- We will also explain what we believe contributed to the success of the social media marketing campaign, including factors such as:
  - Geographical distribution of sentiment around the world
  - Most popular tweets, retweets, and hashtags and accompanying sentiment

Research Question

- Was the product launch of the iPhone X a social media marketing success as measured by Twitter sentiment analysis?
- If the social media marketing launch was a failure or success:
  - What were consumers saying?
  - What factors on Twitter may have contributed to the success or failure of the social media marketing campaign?

Data Collection: Tweepy & Twitter API

- Sought to mine approximately one week's worth of social media “iPhoneX” tweets before & after iPhone X launch date from Twitter's API
- Used Python’s Tweepy to interface with and download data directly from Twitter's API ($N_{Tweepy\ Before}$= 94,012, $N_{Tweepy\ After}$= 100,010)
- Tweets collected initially covered only 5 out of the anticipated 14 days
- Chose to keep Tweepy data for in-depth analyses:
    - Twitter's API data is richer and contains more fields compared to data mined retroactively

Data Collection: GetOldTweets

- Mined an additional 414,850 tweets using Jefferson-Henrique's GetOldTweets (Python, GitHub)
- 5 days before & after physical launch on November 3, 2017 (10 days total)
- Used these tweets for time series, regression sentiment analysis over time and over every tweet ($N_{GOT\ Before}$ = 182,509, $N_{GOT\ After}$ = 232,341)
- We collected over double our previously reported number of tweets for our time series analyses compared to what we had before

Data Analysis

Time-Series Sentiment Linear Regression

- Calculated sentiment scores for iPhone X containing tweets using two different methods to validate internal validity
- Method 1: Novel methodology, sentiment score of each term within a tweet is summed (O'Connor, 2010)
  - AFINN-111, “Bad” has a sentiment of -3, “Good” is 3
- Method 2: Python's Natural Language Toolkit (Vader)

Geolocation Analysis

- Used tweet geolocation information, such as:
  - Longitude and latitude, to interactively visualize where tweets related to the iPhone X originated from
  - Tweet sentiment of people around the world who were talking about iPhone X product launch
- Cleaned using OpenRefine

Top word Sentiment Analysis

- We looked at top word positive and negative words to understand the sentiment before and after the product launch
- We also looked further at the top tweets that are associated with positive and negative sentiment
- The aim of this analysis is to look at how iPhone X product launch affected the overall tweet sentiment.

Popularity Analysis

- Created top hashtag word clouds and histograms of the most popular hashtags,favorites, and retweets associated with the iPhone X before and after the launch
- The aim of this analysis is to show how did the hashtags, favorites, retweets vary before and after the product launch

Limitations

- Used two different ways of collecting Tweets
  - Likely sufficiently representative: collected 600K tweets between both methods (400K & 200K)
- Sentiment scores were calculated for English language Tweets only
- Time series linear regression analysis: correlation is not causation
- Many iPhone X tweets conveying positive sentiment were related to prize drawings lotteries

Results

Interactively visualized on Tableau:

https://public.tableau.com/profile/ayoush.mukherjee#!/vizhome/iPhoneXLaunchSentimentAnalysis/Story2

Conclusion

- Explored how the iPhone X product launch was a success as measured by sentiment analysis before and after the product launch
- Demonstrated that the average sentiment on a global scale related to the launch was positive and increasing before & after launch
- Subtleties coinciding with the iPhone X launch likely contributed to its success, such as the viral and popular nature of the Animoji & “Animoji Karaoke”


like
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best
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broke
dead
grand
right
enough
happy
available
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nightmare
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