

Data Scientist Test

This report belongs to the main reasonings obtained by the tweet data about different companies and their behavior in the stock market. The resolution of the test focus on the following two tasks:

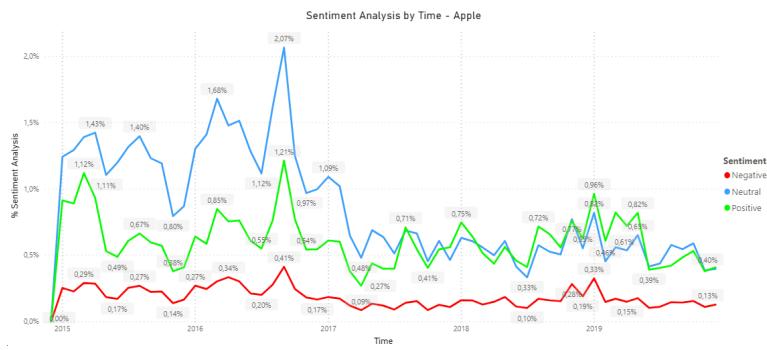
- Sentiment analysis of the companies with a time series in a graph and reasoning the possible declines and rises.
- Which are the main topics that influence each company's rise and decline in the stock market.

The answers to these tasks are detailed in the following sections.

1. Sentiment analysis of the companies with a time series in a graph and reasoning the possible declines and rises.

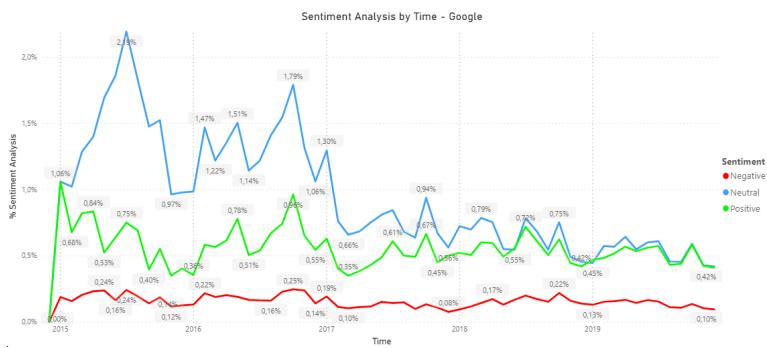
For this task, the tweets have been cleaned and the sentiment analysis was computed. For better and interactive plots the POWER BI tool was used.

- Apple



Negative comments maintain the same slope throughout all 5 years except for a peak that occurs in September 2016. This peak occurs in the same way for positive and neutral comments, this is caused by the 10 years of the launch of its star product, the iPhone. This month the iPhone X was released so both positive and negative comments are increasing. On the other hand, the positive comments have 3 important increases, the one already explained in September 2016, in March 2015, and in January 2019. In March 2015 it is due to a growth in the portfolio and news around Apple's entry into the world of entertainment with their Apple TV. The growth in January 2019 is due to the sales record that Apple achieved and also to discounts that the company promoted. It is interesting to see how the neutral comments decrease from February 2017 while the positive comments have a slight increase.

- Google

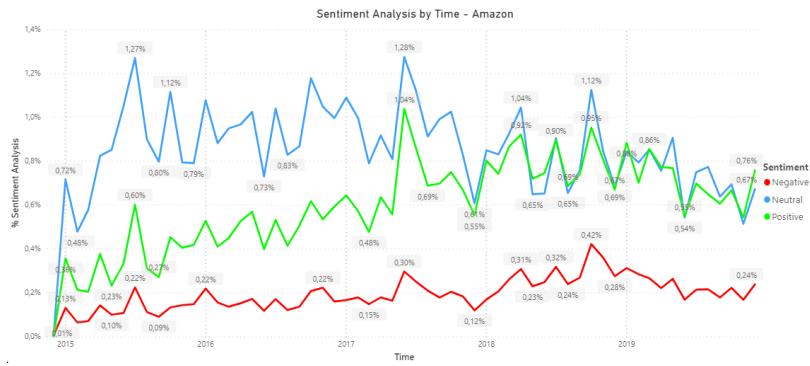


For Google, its negative comments have been constant over the 5 years without increasing or decreasing them. However, the positive comments have a slight increase in their slope with different peaks over time. The peak with the greatest pronunciation occurs in October 2016 due to launches of new technology in

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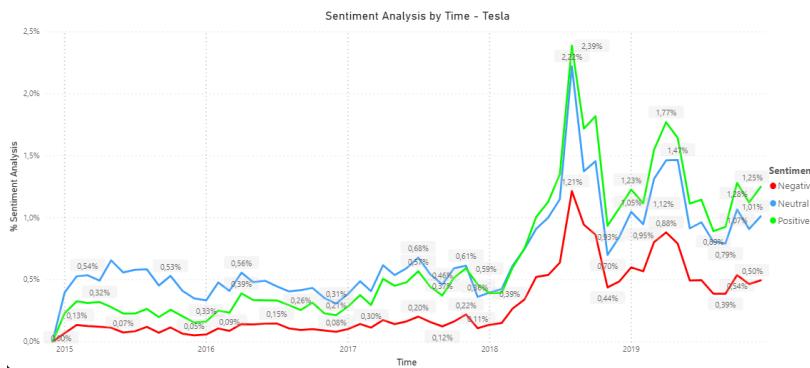
alliance with the company Alphabet Inc. In addition, the increase is also due to the launch of its new pixel cell phone, cataloged at that time as the Smartphone with the best camera, the one that had better reviews than the iPhone. On the other hand, there is a peak in neutral comments that occurs in July 2015, but it is due to a high number of responses from the same user (perhaps from the same company) that responds to user uncertainties.

- Amazon



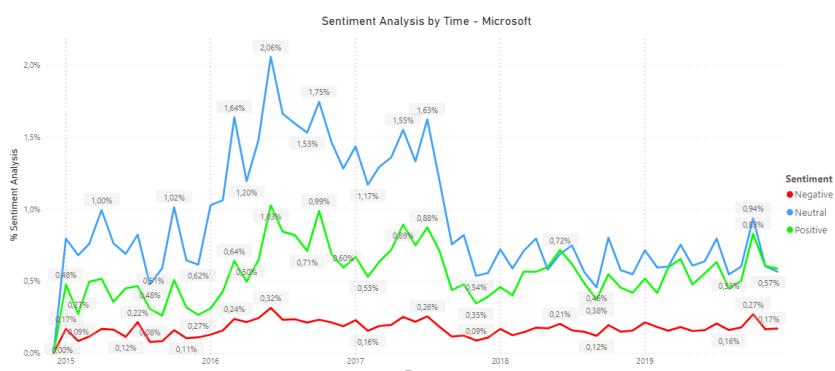
In general, Amazon has an increase in negative and positive comments as neutral tweets decrease. The significant increase in positive opinions is evidenced in June 2017 due to the company announcing its participation in the supermarket sector (whole foods market). However, 2 years later there is a decrease in these comments and an increase in negative opinions due to political issues with Trump that are linked to the company, as well as doubts about the veracity of Amazon tax payments.

- Tesla



Tesla has a different behavior from the other companies. From January 2015 to February 2018 the behavior of its positive, negative, and neutral tweets is constant. However, after April 2018 the three types of tweets have a significant increase reaching their peak in August 2018. This change in the slope is due to comments of its CEO, Elon Musk, saying that the company would not belong anymore in the stock market. Nevertheless, after several weeks these comments were denied allowing Tesla to continue trading on the stock market. This is the main reason why the increase of negative and positive comments occurs in the same period.

- Microsoft



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For Microsoft, the negative comments are constant over the 5 years, but the positive comments have a high peak of one year (from June 2016 to June 2017). This is due to the company's cloud service, the launch of Xbox One, improvements in its Minecraft education platform, and the company's purchase of LinkedIn. In the same way, neutral comments have a peek at the same time due to the same topics, but with the difference of being informative rather than opinion comments.

2. Which are the main topics that influence each company's rise and decline in the stock market.

For answering this task, after cleaning and computing the sentiment analysis of the tweets, a word cloud has been computed for each type of analysis (positive or negative) in all the companies. By doing this chart the main topics can be visualized easily.

- Apple

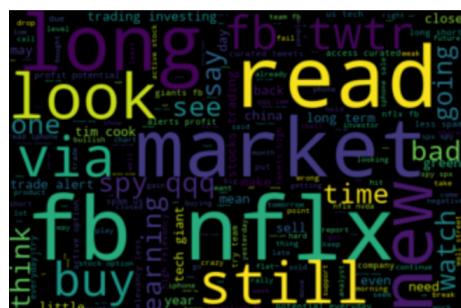
A. Positive

The positive comments that influence the stock market are related to the launch of the new products that Apple brings out, for this reason, topics such as the new iPhone, iPad mini, Apple Watch are presented as main in the tweets. The main topics also refer to "stock free" and "join stock" where apple is completely linked to the stock market.



B. Negative

Among the negative comments, the main topics refer to "trading investment", "trade alert" and "market". These topics can be considered more "technical" within the stock market. Also on these tweets, the name of Tim Cook (CEO of Apple) can be seen. Words like "spy", "close", "need break" demonstrate the insecurity of a company in front of different investors.



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- Google

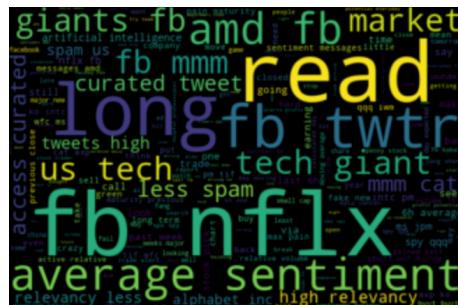
A. Positive

In the positive comments of Google the word "free" is quite prevalent, it appears in main topics like: "free trading", "free trial", "next free". Additionally, these go by the hand with "traders" allowing a combination that captive attention for the stock market.



B. Negative

Among the negative comments technological terms such as "artificial intelligence" and "spam" appeared, as well as descriptions for the company such as "tech giant". In addition, the name of "alphabet inc", a company that provides the necessary resources for ambitious projects, also appears as the main topic.



- Amazon

A. Positive

The main topics in the positive tweets from Amazon refer mainly to "trading". In addition, there are many comments related to the quality of the company's services such as: "real time", "free trial" and "one free".



B. Negative

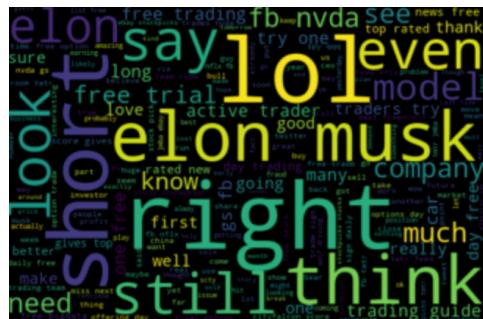
The relevant topics in the negative comments are addressed to the market itself, such as "trade alert", "stock", "profit alerts", and "profit potential". In addition, the word "long" is a characteristic of these tweets, where it could be inferred as the long waiting times on its services.



- Tesla

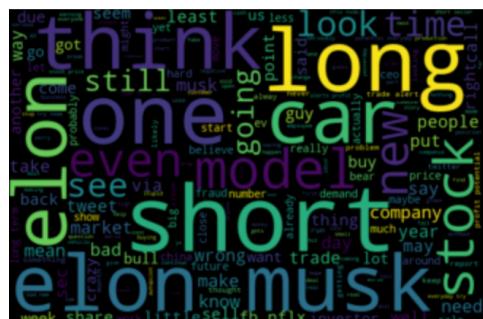
A. Positive

In the positive tweets for Tesla, the main topic talks about the CEO of the company Elon Musk. However, topics that also are striking have principal words such as "think", "right" and "first", words that are common characteristics when speaking about Tesla.



B. Negative

It is interesting to see how in the stock market Tesla depends on what Elon Musk says, this is why his name also appears as the main topic in negative tweets. However, topics referring to the company's main product such as "car" and "new model" also appear. The launch of new technology in the company has a lot to do with seeing the behavior in the stock market for Tesla.

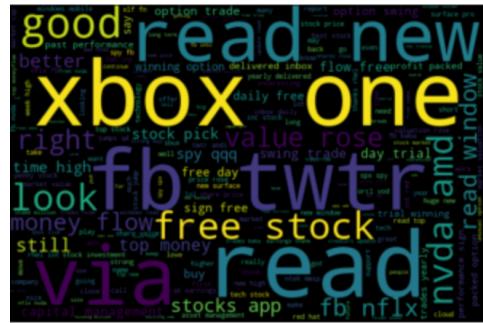


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- Microsoft

A. Positive

The positive comments refer to one of the star products of Microsoft, which is the Xbox One.



B. Negative

Negative tweets at Microsoft refer to technology topics such as "spam", "artificial intelligence" and "windows".

