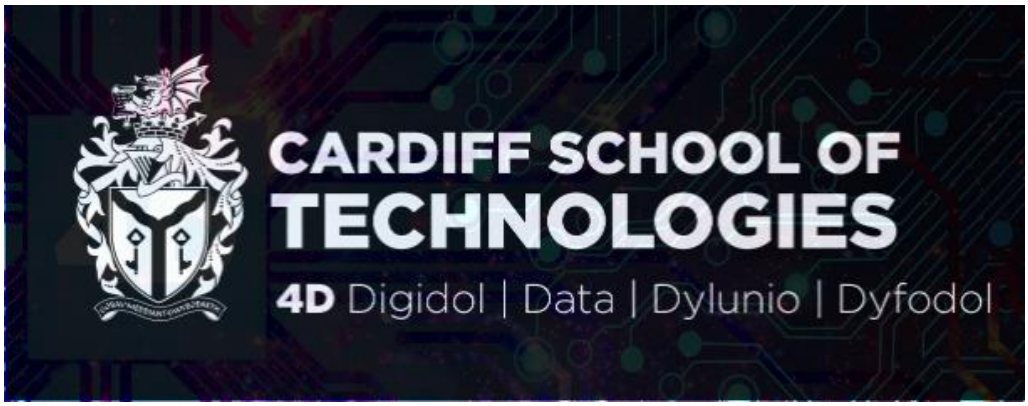


CIS7029 Social Media Analytics for Business

Module Leader: Dr Esyin Chew

# Title - Application of Social Media Analytics: Comparative Study of Apple Inc. and Samsung Electronics Co. Business Engagement.

By

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## Biography

As a data analyst of Samsung Electronics, I am keen to analyze and compare social media engagement of my company with one of our major competitors, Apple. My aim in this research is to explain the process of finding meaning from social media information, in a complete and proper way. My focus is on in-depth social media engagement that have the potential for generating extensive and detailed accounts of customer's response and business 's interaction. I also discuss the data analysis process for social media analysis that can compare our social media engagement with Apple's and its impact on brand image.

## Abstract

The purpose of this research is to find out how Apple's and Samsung's social media engagement is linked to their respective brand image. Also, how both the companies interact to their customers and strategize their marketing techniques. In this paper social media data is scraped using web scraping tools and is further visualized for better understanding of the outcomes. Further, a sentiment analysis is also conducted to examine the polarity and subjectivity of the customer's feeling towards the companies. On comparing the social media strategies of both the companies it was evident that Samsung as a company has been more active on social media platforms whereas, in the case of Apple, its social media engagement is customer driven. Also, this means that comparatively more individuals follow the company Apple on different social media platforms. Knowing the brand image of Apple in the world market and its limited social media strategy, the results show that people are willing to interact with the company and follow its activities. In the last section I also present the recommendation, limitation and future scope of this research.

# Table of Contents

## Introduction

Social media is a unique form of internet-based communication, which allows users to create and share information with others all around the world. It encompasses many websites and apps like Twitter, Facebook, Instagram, YouTube, Wikipedia etc. Nowadays these platforms have become an important part of not only for personal use but for professional use as well. On the personal level, social media platforms permit to speak with relatives and friends, grab new information, develop your hobbies and interests, and engage. On the expert level, organizations can avail social media to broaden their insight about particular field and construct networks by interacting with different experts in the business. At the organizational level, social media permits user to consult with companies, gain client feedback, and uplift company's brand image. Since most of the people are gaining information and sharing their feelings on social media on a daily basis, this has changed the interaction between firms and customers dynamically (Wang and Namvar, 2019). Social media gives organizations numerous opportunities. It gives a new and ground-breaking marketing channel that is minimal expense and can be saddled to expand client awareness toward organizations and their related brands, and improve in general business effectiveness. It additionally empowers organizations to improve their client connections through better commitment on an ongoing premise (Kurniawati, Shanks and Bekmamedova, 2013).

In order to examine the role of social media on businesses, in this paper, I conduct a social media analysis to compare business engagement of companies with its customers. Social Media Analytics (SMA) is a fast emerging competence that gives associations the capacity to dissect and decipher information on different social media platforms to evaluate changing perspectives and behaviour of people. SMA also provides insights about client esteems and sentiments to organizations, which allows it to plan new marketing campaigns for its products and services. SMA might be used to evaluate one's own brand image or its competitor's brand image in the market. Social media administrations, for example, Twitter, Facebook, YouTube, empower business organizations to partake effectively in online word-of-mouth communication. Electronic word-of-mouth (eWOM) correspondence can have immense impacts on business organizations. EWOM messages have solid impacts over online brand trust. Additionally, eWOM messages profoundly correspond with the organization's activities (Zhang, Jansen and Chowdhury, 2011).

The content on social media is an asset for the organizations. There are two type of contents that can be generated on social media platforms, namely User-generated content (UGC) and Firm-generated content (FGC). The difference between two contents is that the former is produced by the public but its understanding is difficult data over-burden and time restrictions, and the latter is produced by the organization itself to improve client collaborations (Wang and Namvar, 2019). Other than this, business leaders are not just intrigued by consumers' opinion on their own items and administrations; they additionally need to understand consumers' opinion on the items and administrations offered by their business rivals. Organizations need to realize how their items are seen by purchasers, and whether they have a decent standing on

the lookout. They likewise need to comprehend their own competitive advantage, in examination with rivals (Kim, Dwivedi, Zhang and Jeong, 2015).

In this research, my aim is to analyze Apple Inc., an USA based multinational company and Samsung Electronics Co., which is a South Korean based multinational company. They are headquartered in Cupertino, California and Yeongtong District of Suwon respectively. Apple is a technological company whereas, Samsung is an electronic company but in the technology sector, under mobile industry, Apple and Samsung have been competing for a long period (Interbrand: Apple is the most valuable brand, Google drops out of top 3, 2020). The current 2020 statistics about the world-wide ranking (brand value), absolute brand value, net worth and revenue generated by both the companies are presented in Table 1 (Samsung Electronics Becomes Top Five in Interbrand's Best Global Brands 2020, 2020). It shows that Apple outshines Samsung in terms of values and also have been positioned at the top globally (Apple Revenue 2006-2020 | AAPL, 2020).

Table 1: Statistics of Apple Inc. and Samsung Electronics Co.

| Companies | Ranking | Brand Value (in billion) | Revenue (in billion) | Net Worth |
|---|---|---|---|---|
| Apple Inc. | 1st | $323 | $274.5 | $2 trillion |
| Samsung Electronics | 5th | $62.3 | $54.5 | $295 billion |

Source: (Samsung could report $54.5 billion in sales for Q3 2020, 2020) (Apple: Revenue 2019 | Statista, 2020) (Ians, 2020)

On comparing the social media strategies of both the companies it was evident that Samsung as a company has been more active on social media platforms than Apple. Apple has an odd methodology with regards to promoting its brand. It has a moderate presence on online media but it advances promotion through television commercials (TVCs). Samsung, in the interim, is available on a variety of social media like YouTube, Twitter, and Facebook pages for Samsung Mobile, Samsung TV, and more.Samsung has additionally associated with major applications to target public with social interactions. In Apple's case, its major promotion happens through word-of-mouth, that is when more people see others having Apple products, they are constrained to have one; this is called "halo effect" (DSIM- Digital Marketing Blog, 2017).

Apple is utilizing exposure for free but then it is an incredible approach to attract public. One part of social networking that Apple have been all the more ready to take advantage of is customer support, like on twitter it has a separate page @AppleSupport to communicate with its users (How do Apple use Social Media? - Giraffe Social Media, 2016).
Apple appears to perceive the intensity of the medium. It utilizes social media, however in manners that benefits its clients. Therefore, Apple has more UGC and the company itself doesn't post much on social media (Apple Has A Social Media Strategy That's Completely Strange, Yet Makes Perfect Sense, 2017). Conversely, Samsung is utilizing social media to advertise its electronic items on every single imaginable channel to reach out to as many people as possible. Samsung incorporates inciting strategies by bringing down the costs of its products,

making it more reasonable for clients. Therefore, Samsung has more FGC and hence participates more on social media platforms than Apple (DSIM- Digital Marketing Blog, 2017). Along these lines, to stay aware of their current positions and to turn into a pronounced pioneer, both of the brands need to have successful marketing techniques. Thus, both the companies continue to innovate and experiment other methodologies to enhance their respective brand values (DSIM- Digital Marketing Blog, 2017). In the technology sector, Apple is considered to be the top innovator and Samsung is a solid contender to it.

For the social media analysis of both the companies I majorly study two social media platforms, Twitter and YouTube, to compare their business engagement. Twitter is a social website that permits brands and clients to interact through short messages — otherwise called "tweets." Twitter has roughly 336 million active users per month. YouTube is the biggest and most well-known video-sharing social media globally to more than 1.8 billion active users per month (Tran, 2020).

My motivation for this research paper is to find out how social media analytics bring benefits such as brand image and customer response to an organization. Also, what are the sentiments of the consumers towards both the companies as they spend their resources into SMA to more readily comprehend the customers' behavior and their positions in the market. SMA utilization with enormous digital networks empower organizations to effectively connect to the public with remarkable scale and lower cost. Additionally, it would be interesting to analyze Apple and Samsung as they use social media platforms with different aims.

This paper is structured as follows. Section 2 is the design of the research conducted, which includes the web scraping techniques that have been used and justification of the methodology. Section 3 presents the results and visualizations of my research, which further explains the story behind this paper. Section 4 concludes the paper with final results, project limitations and future scope.

## Design and Discussion

The methods that have been used in this paper to analyze social media engagement of Apple and Samsung are mentioned below.

I have used some web scraping tools like scraper, octoparse and data miner to scrap social media data. These tools gather web information from other websites as structured text. The social media data could also be collected using APIs but due to information security major websites like Facebook and Instagram are making it progressively hard to scrape data for academic research purposes (Batrinca and Treleaven, 2014).

The tools used in the research are discussed below:

1. Data miner: It is a Google Chrome and Microsoft Edge program expansion that helped me scratch information from social website pages and into a Excel file (Data Miner, 2019) (See appendix A.1and A.2).
   Its main features are :
   - One click scraping
   - Fastest table scrapes
   - Custom scraping
   - Pagination

2. Scraper: It is an extremely straightforward (yet restricted) information harvesting tool to get data into spreadsheets quickly. It is expected to be a simple to-utilize tool for users who are comfortable with XPath (See appendix A.3).

3. Octoparse: It is an extraordinary Automated Web Scraping programming software. It is a cloud-based web crawler that helped me to instantly separate social web information without coding progressively. I utilized octoparse for extracting bulk data from social sites as this product is intended to harvest information from both static and dynamic sites. Octoparse extracts venture either on your own nearby machine (Local Extraction) or in the server (Cloud extraction). There are different formats like CSV, Excel designs, HTML, TXT, and information base (MySQL, SQL Server and Oracle) to extract information (See appendix A.4).
   Its main features are:
   - Point-and-clicking interface
   - Extracts web data precisely
   - Extracts data in any format

The above-mentioned tools helped in extracting information on Apple and Samsung's YouTube and Twitter official pages. The data extracted included number of tweets; likes, re-tweets and comments on each tweet. Also, YouTube data on number of views on each video uploaded with its title and time duration was collected using these tools for both the companies.

For visually representing the data scraped and I used Tableau Desktop software. As the market-driving decision for current business knowledge, this tool is known for converting any sort of information from almost every system, and transforming it into more useful insights easily. The results presented in the next section were created using tableau (Tableau Software).

Main features of tableau (Tableau Software):

- Live visual analytics
- Interactive dashboards help you uncover hidden insights
- Quickly build powerful calculations from existing data, drag and drop reference lines and forecasts, and review statistical summaries
- Make your point with trend analyses

The second method of social media analysis is sentiment analysis. It applies the processing of natural language and modern linguistics used in today's social media platforms, to recognize and separate subjective sentiment data (Annett and Kondrak, 2008). For example, this analysis identifies the sentiment of text on social media in the form of tweets and comments. It quantifies the expression of people inside the text. A sentiment can be differentiated as happy and unhappy, which is positive and negative feelings respectively. In business environment, these feelings show customer's level of confidence towards the organization (Carpenter and Way, 2012).

The tools used for sentiment analysis are:

1. Sentiment Viz, which focus on visualizing the sentiment of tweets posted on Twitter. Tweets are presented using several visualizations techniques (See appendix A.5) (Ncsu.edu, 2019):
    a) Sentiment tab: it visualizes the sentiments of the tweets in the form of scatterplot with happy and relaxed sentiments on its both axes. The spatial dissemination of the tweets sums up their overall feeling.
    b) Timeline tab: It visualizes the time of tweets when they were posted in the form of bar graph. The happy tweets are represented as green bars above the horizontal axis and the unhappy tweets as blue bars below the same axis. The stature of a bar in the chart shows the quantity of tweets posted throughout the time range covered by the bar. Bars are divided into four parts showing the quantity of relaxed and happy tweets—in dim green and light green—and the quantity of upset and unhappy tweets—in dull blue and light blue.

Using this tool, I studied the sentiments of the tweets of both apple and Samsung for 5 continuous days to check the trend of sentiment scores and since data cannot be extracted from this tool, I took the screenshots and analyze the sentiments.

2. Python (TextBlob): Python is basic yet incredible programming language with amazing usefulness for handling phonetic information. Python can be applied to any territory we are keen on by broadening it with area libraries, implanting it in an application, or utilizing it without help from anyone else (Lutz, 2001). Lutz, M. (2001).

Using this language with tweets as the input, Textblob returns sentiment polarity and subjectivity as the output. Polarity explains the extremity of the sentiments which always lies between [-1,1], -1 being the most negative sentiment and 1 being happiest sentiment (Sarlan, Nadam and Basri, 2014). Sarlan, A., Nadam, C. and Basri, S. (2014). On the other hand, subjectivity quantifies the strength of words and evaluates the measure of personal and real data contained in the content. The higher subjectivity implies that the content contains genuine belief instead of factual data (Shah, 2020).

```
from textblob import TextBlob
text = ‘ '
ob = TextBlob(text)
print(ob.sentiment.polarity)
print(ob.sentiment.subjectivity)
print(ob.sentiment)
```

Using the above code, I calculated the sentiments of 10 tweets of each company and calculated their polarity and subjectivity.

Python can also be utilized for information scraping from social websites because it provides full control over it and is flexible as to which kind of data can be scrapped. But it is very difficult to get access to API for different websites to scrap data out of it. Python is a difficult language as it requires understanding of various coding techniques and have relevant skills to recognize the scraping methods such as knowledge of the working of the python libraries like scrappy and beautiful soup. It is also a time consuming process as one would require more time to analyse websites that apply different development methods and anti-scraping techniques. On the other hand web scraping tools have lower learning cost than python and gives easy access to data, therefore I used these tools to analyse Apple and Samsung’s social media engagement.

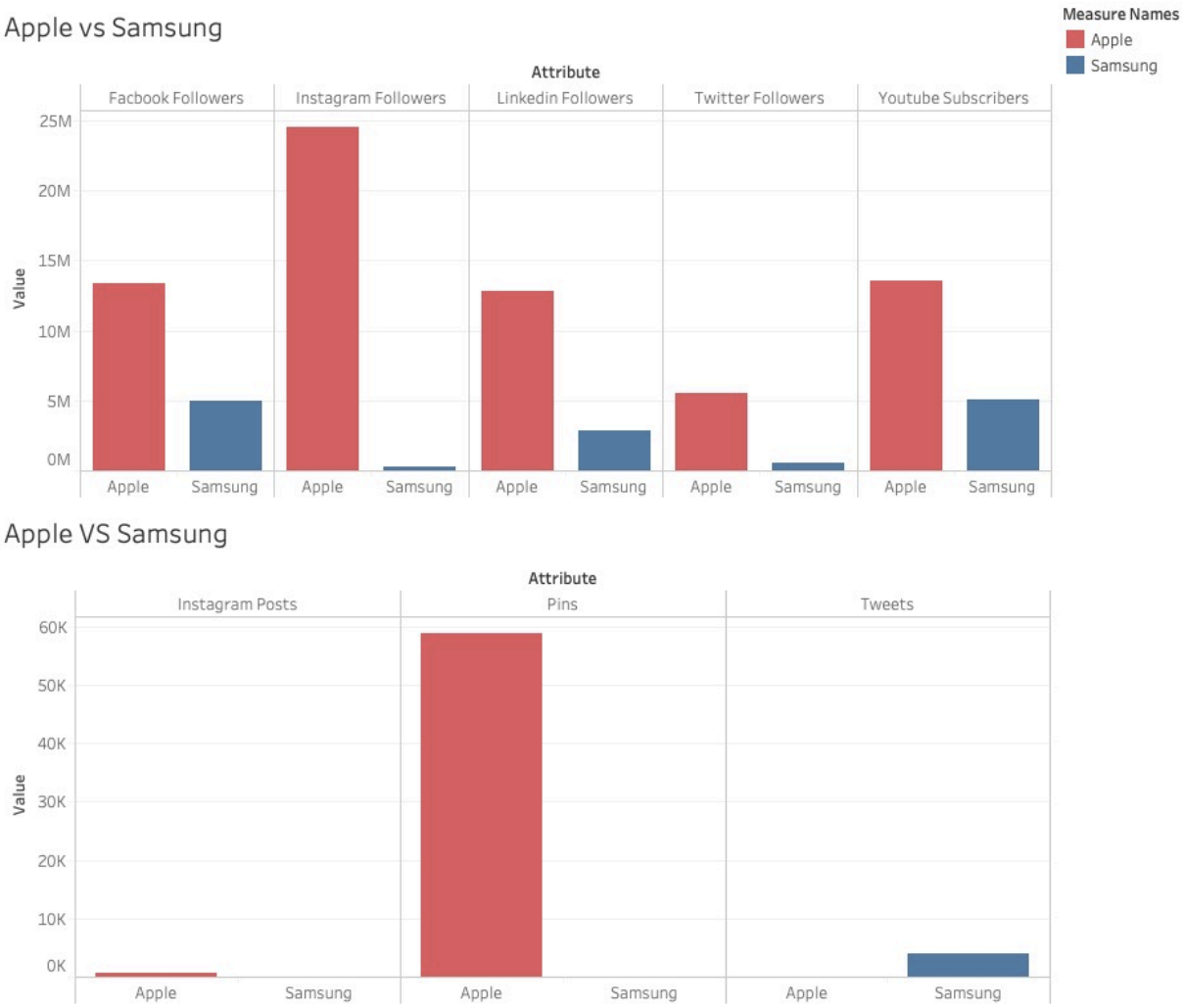
Other source that I used for SMA is ‘Google Trends’, which enables people to investigate ‘trending stories’, an assortment of searching inquiries recognized by Google’s calculations, by categories and areas. Google trends depend on google search items and represent the search index of a specific keyword comparative with overall volume of search during a time period (Chang, Ku and Chen, 2019). The data collected from this source includes the number of people who showed interest worldwide in Apple and Samsung by searching about them on google in last five years. The next section summarizes the main results of this research.

## Key Results and Visualizations

The required data was collected from both the company's respective social web pages. The following results show the number of followers of Apple and Samsung and their level of engagement (See appendix A.6).

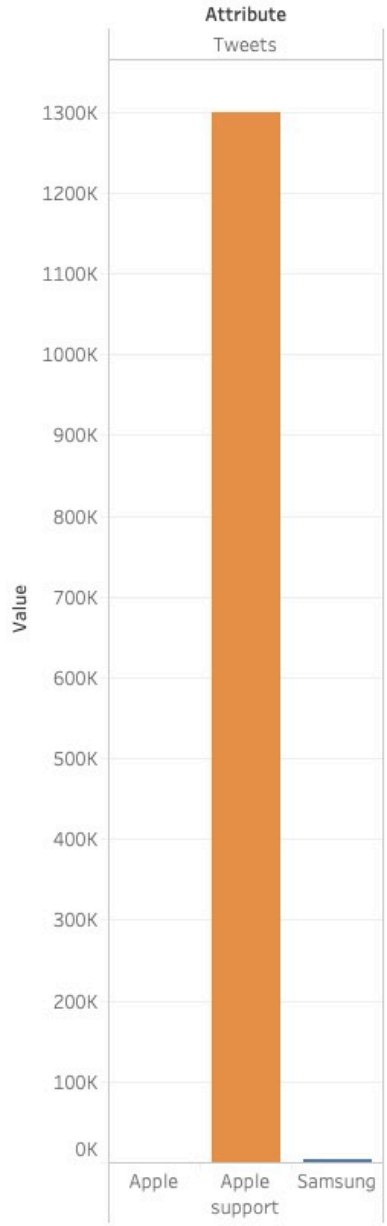
Figure 1 depicts that Apple has more followers than Samsung on Facebook, Instagram, LinkedIn, twitter and YouTube. This means that comparatively more individuals follow the company Apple on different social media platforms. Knowing the position of Apple in the world market and its limited social media strategy, the results show that people are willing to interact with the company and follow its activities. This has benefited Apple in growing its brand image as compared to Samsung. Although the company Samsung is not followed as much on social media but it invests in related strategies to promote and engage with its customers.

Figure 1: Comparison of Apple and Samsung's social media engagement



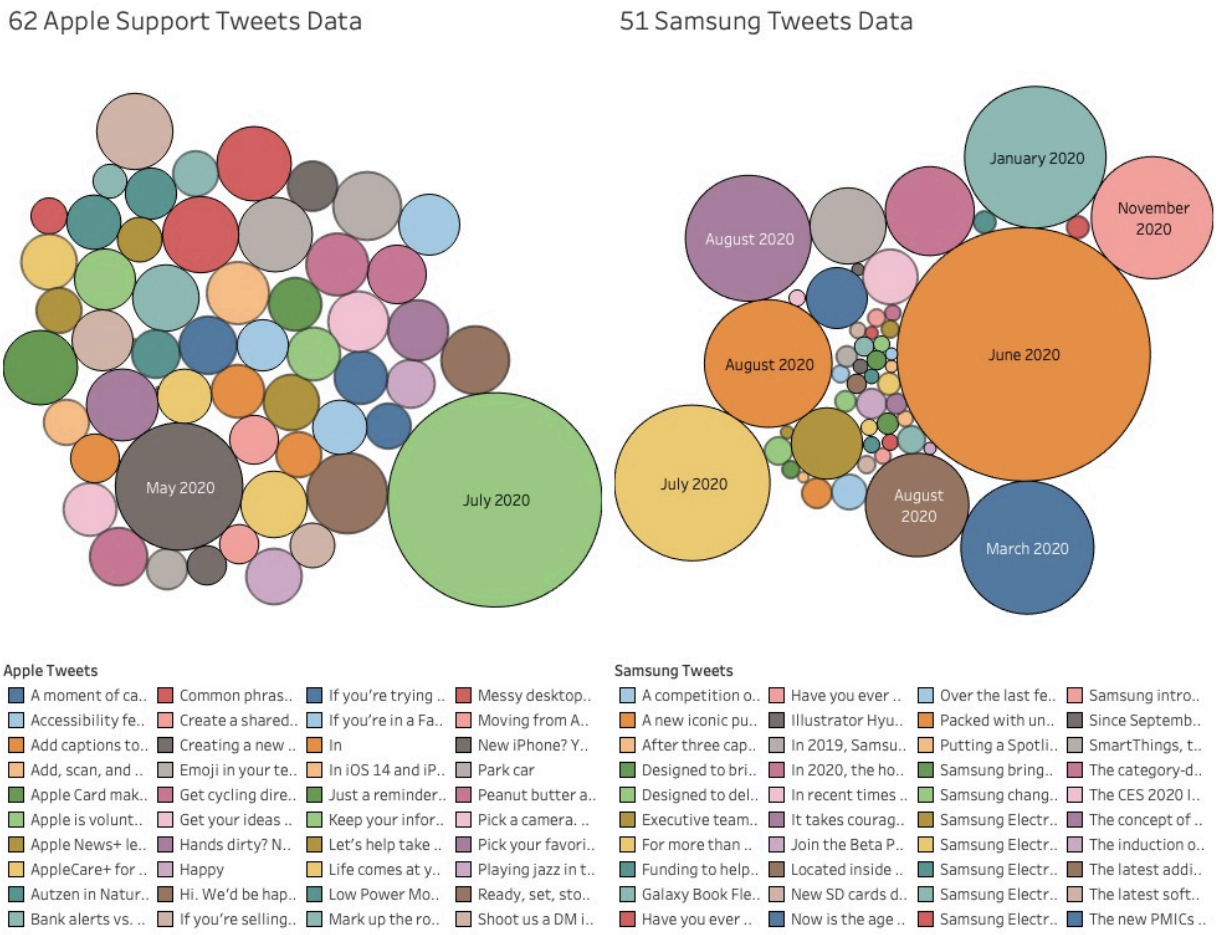
Comparing the number of tweets of Apple and Samsung on their respective official twitter web-pages, it was evident that Apple has not yet tweeted anything and Samsung has 4032 tweets. Therefore, I scraped some tweets from another twitter web-page of Apple company called AppleSupport. Results of this comparison are presented in Figure 2 that shows Apple has tweeted more than Samsung. It can be inferred from this figure that Apple mainly uses twitter to guide and support customers rather than marketing its products. Conversely, Samsung uses twitter to update its customers with its new upcoming products and events. Thus, this shows how these two similar organizations engage on social media platforms with their respective customers by having different strategies.

Figure 2: Comparison of tweets between both the companies



Focusing on twitter, I further analyzed the tweets of AppleSupport and Samsung separately by comparing the highest number of likes, re-tweets and comments on 62 AppleSupport tweets and 51 Samsung tweets. Figure 3 presents a packed bubble graph for each tweet of both the companies respectively. The size of each bubble represents the customer response on that particular tweet. The figure shows that the largest bubble of AppleSupport tweet, which was informing about recent updates, posted in July 2020, had 6.5k likes, 124 re-tweets and 64 comments. Comparatively, largest bubble of Samsung Tweet, which was promoting a new design of its product, posted in June 2020, had 27.6k likes, 7.1k re-tweets and 193comments.Although, @Apple and @AppleSupport have more followers than @Samsung, yet Samsung experiences higher customer response and engagement than Apple. This shows that customers respond actively on a promotional tweet (Samsung) rather than on an updating tweet (AppleSupport). Another reason for this difference in customer engagement could be that Samsung tweets on its official twitter page, building more trust, unlike Apple, which uses its support page to communicate with its customers.

Figure 3: Bubble representation of Twitter showing customer response on each tweet



Moreover, I conducted 5-day sentiment analysis on the tweets of both the companies to analyze sentiment scores on particular day (See appendix A.7 and A.8). Figure 4 and 5 compares sentiment analysis of tweets of Apple and Samsung respectively. It shows that 363 people tweeted Apple in a duration of 1hour whereas, 234 people tweeted Samsung in a day. It is clear that a greater number of people are happy and relaxed while tweeting apple as compared to Samsung, showing high confidence towards the company. Secondly, less people are unhappy and upset while tweeting Samsung compared to Apple. This means Apple faces greater reaction from customers who has unpleasant experience with the company. Overall Apple's engagement on twitter is extensive resulting in higher number of happy and unhappy sentiment scores of tweets as compared to Samsung. This same trend was observed for all 5 days of the analysis.

Figure 4: Sentiment analysis of one hour on Apple's tweet

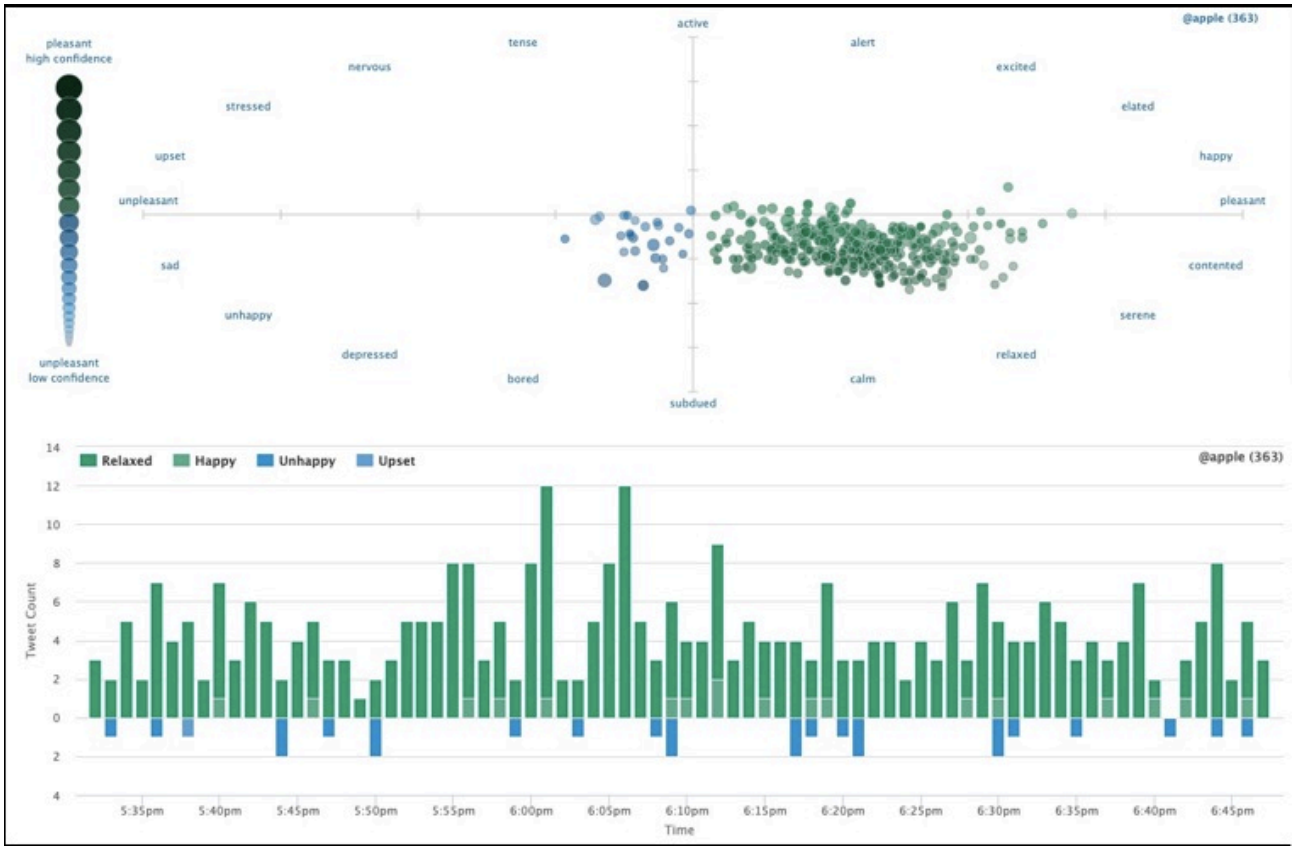
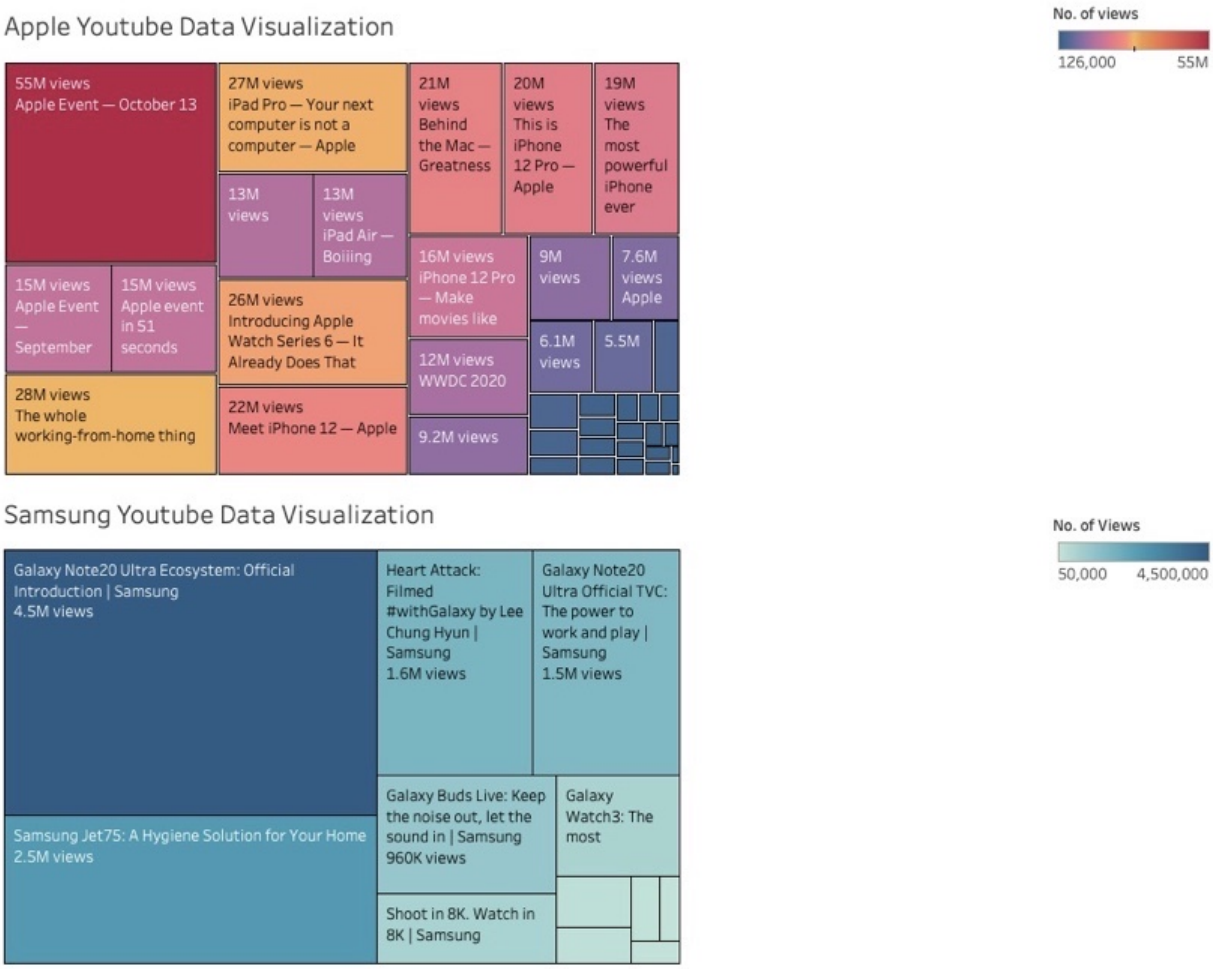


Figure 5: Sentiment analysis of one day on Samsung's tweet


In order to precisely analyze and compare the sentiment scores of tweets related to both the companies, I used Python TextBlob sentiment analysis. I provide a happy and an unhappy tweet each for both the companies as an example for this analysis (see appendix A.9 – A.12). The positive polarity and subjectivity of Apple's tweet is 0.75 and 0.875 respectively whereas for Samsung it is 0.566 and 0.6 respectively. The negative polarity and subjectivity of Apple's tweet is -0.33 and 0.43 respectively whereas for Samsung it is -0.4 and 0.6 respectively. The output obtained confirms that the polarity and subjectivity of Apple's happy tweet was higher than Samsung's happy tweet. It also shows that the polarity and subjectivity of Samsung's unhappy tweet was higher than Apple's unhappy tweet. Therefore, Apple's customers have a higher sentiment score on positive tweets and lower on negative tweet compared to Samsung.

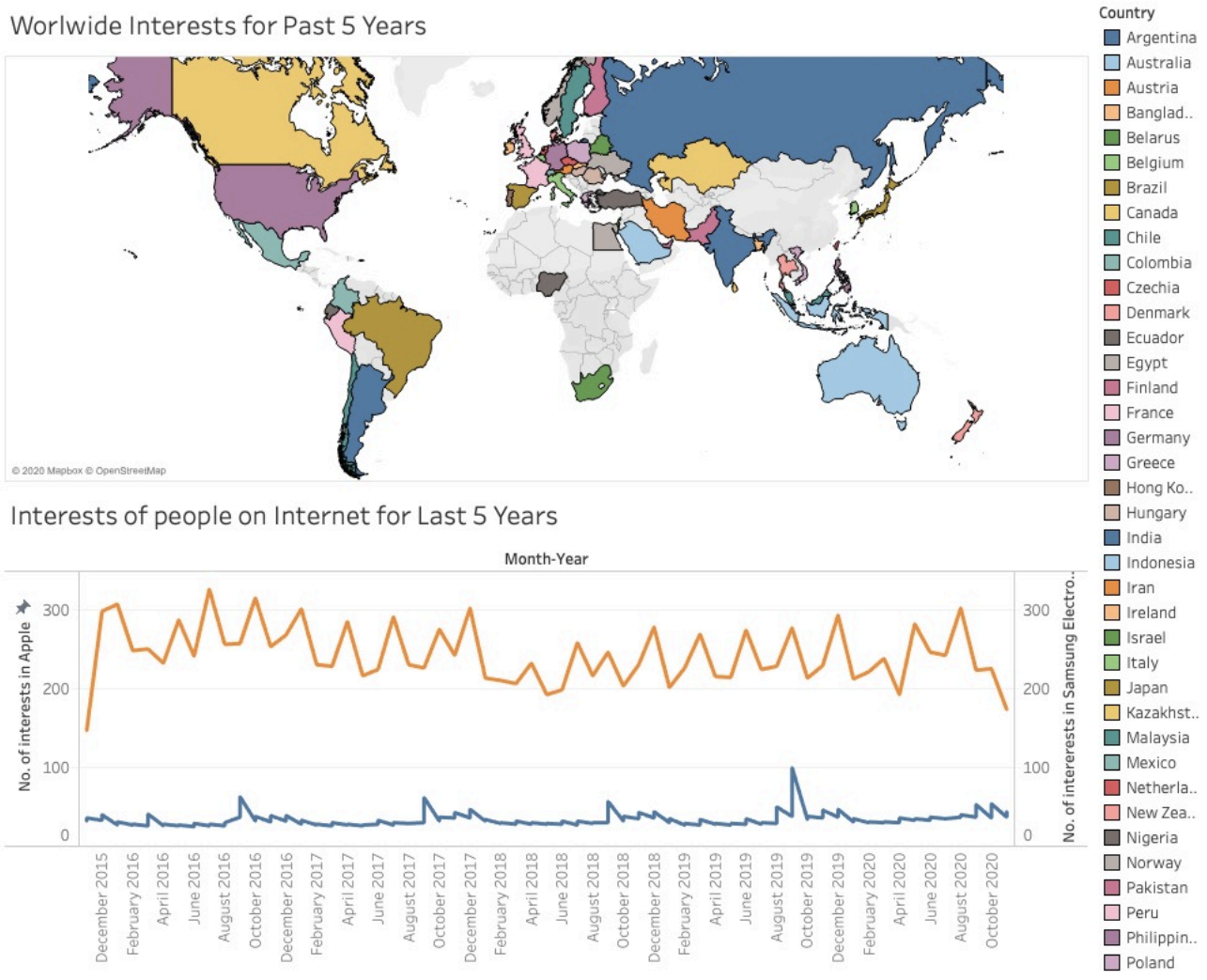
The second social media platform used for analysis of customer engagement is YouTube. The total number of videos on Apple's and Samsung's YouTube page are 190 and 1246 respectively. Figure 6 shows tree-maps of views on the Apple's and Samsung's YouTube videos. According to the data scraped from YouTube's official pages of both the companies, Apple's launch event video got 55 million views, which was its highest number of views whereas Samsung's product introduction video got 4.5 million views. On average Apple receives 9.02 million views and Samsung receives 885,000 views on their respective YouTube videos. Thus, due to higher number of YouTube subscribers and popularity of its events, Apple's videos are more viewed than Samsung's. This shows more people are interested and hence are following Apple's content. On the other hand, although Samsung has more total number of videos still a smaller number of views are obtained on its videos. Therefore, it's not the quantity but the quality of Apple's videos that helps the company to maintain its brand image.

Figure 6: Tree-map visualization of YouTube showing number of views on each video



In this research I also analyzed the interest of people on the internet for both the companies. Figure 7 compares the worldwide interests of people on Apple and Samsung for last 5 years. The result shows that in last 5 years people have shown more interests in Samsung on internet as compared to Apple. This could be because Samsung is more popular in highly populated yet poor countries. The trend in the graph shows that there is a significant increase in interests of people for Apple during the months September and October. This could possibly be because Apple usually organizes its product launch events in these months. On the other hand, there are many ups and downs in the trend of people's interest on Samsung. It can also be inferred that 95%, 67% and 57% of people show interest in Apple in rich countries – Japan, USA and Australia respectively. For Samsung, people in Indonesia, Bangladesh and Pakistan show 94%, 92% and 89% interest respectively. This could be due to varied price range of Samsung's products, which make it more affordable in comparatively poor countries.

Figure 7: Visualization on interests of people on internet for last 5 years



## Conclusion

From the above results it can be concluded that overall Apple Inc. has more social media engagement as compared to Samsung Electronics Co. It can also be inferred that Apple's major interaction on social media is because of user generated content, which means people are more active on the company's official social media page than the company itself. On the other hand, Samsung has more firm generated content, which shows that the company has more proactive approach towards social media engagement. This could possibly be due to different marketing strategies that both the companies incorporate to promote its brand image (Wang and Namvar, 2019). Apple, for example aims to use Twitter to respond to its customers by solving their queries and YouTube mostly for launching its products. Conversely, Samsung intends to promote/advertise its products and be connected to its customers through various social media platforms. Since Apple has more followers on Twitter and subscribers on YouTube than Samsung, therefore the brand value of apple is also much higher than Samsung. I recommend, in future, Apple and Samsung can improve their social media engagement to attract more customers and improve it brand image by focusing on FGC and UGC respectively (Kim, Dwivedi, Zhang and Jeong, 2015).

This research had some limitations; firstly, Access to social media data was limited because of which I was only able to collect data from YouTube and Twitter for this analysis. Secondly, I examined the impact of social media on both the company's brand image rather than business value as the value dependent on many other business factors such as product quality, price and other marketing strategies. Lastly, due to difficulties in obtaining different APIs of different social media platforms, python could not be used for the analysis. The further scope of this study is to improve the analysis by keeping the above-mentioned limitations in mind. Also, how companies can improve their social media engagement to better perform in this competitive and volatile market.

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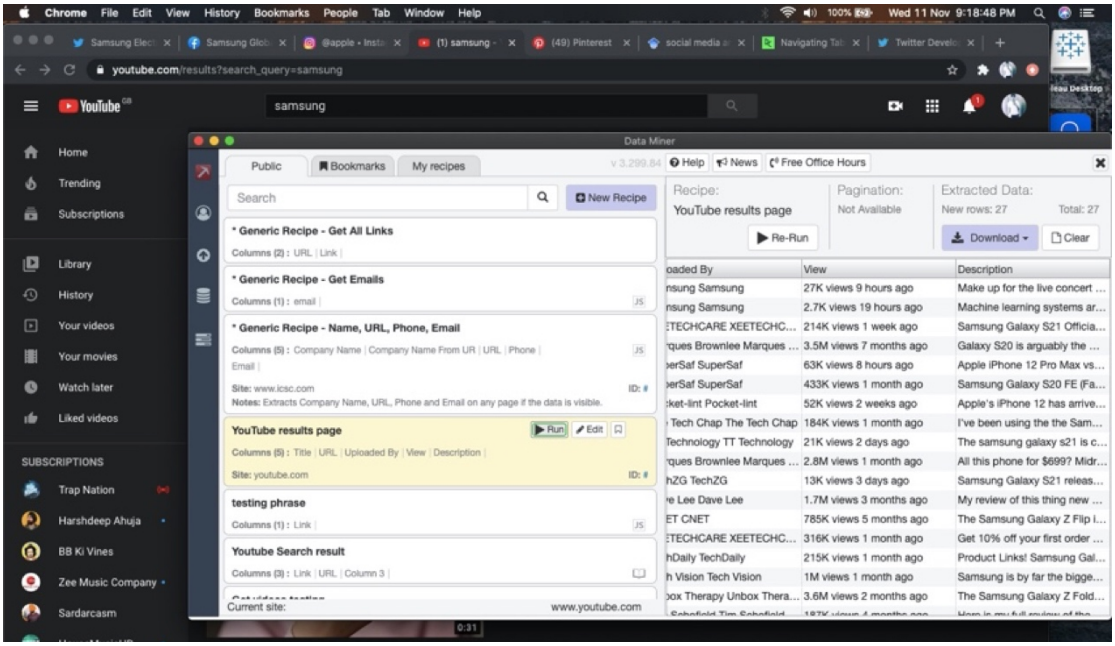
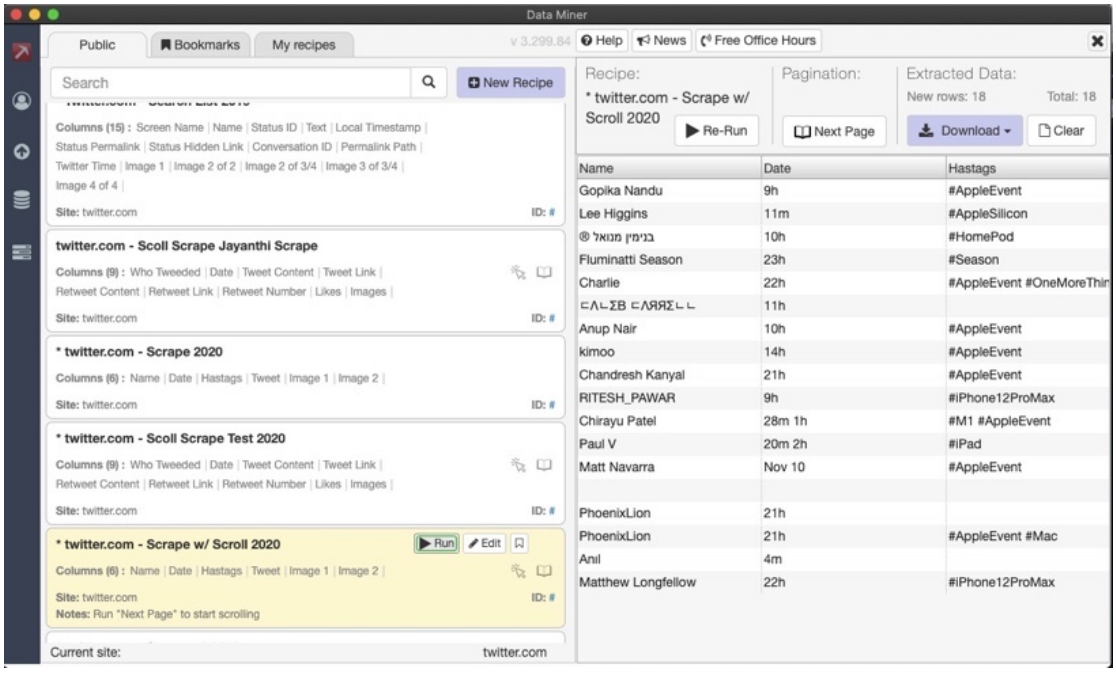
# Appendix

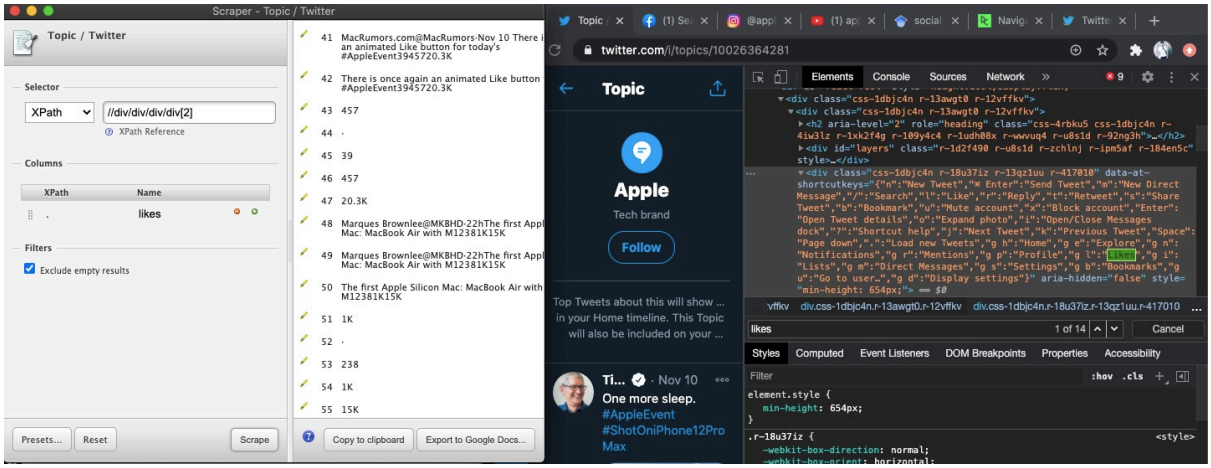
## A.1 Scraping Samsung's YouTube data from data miner



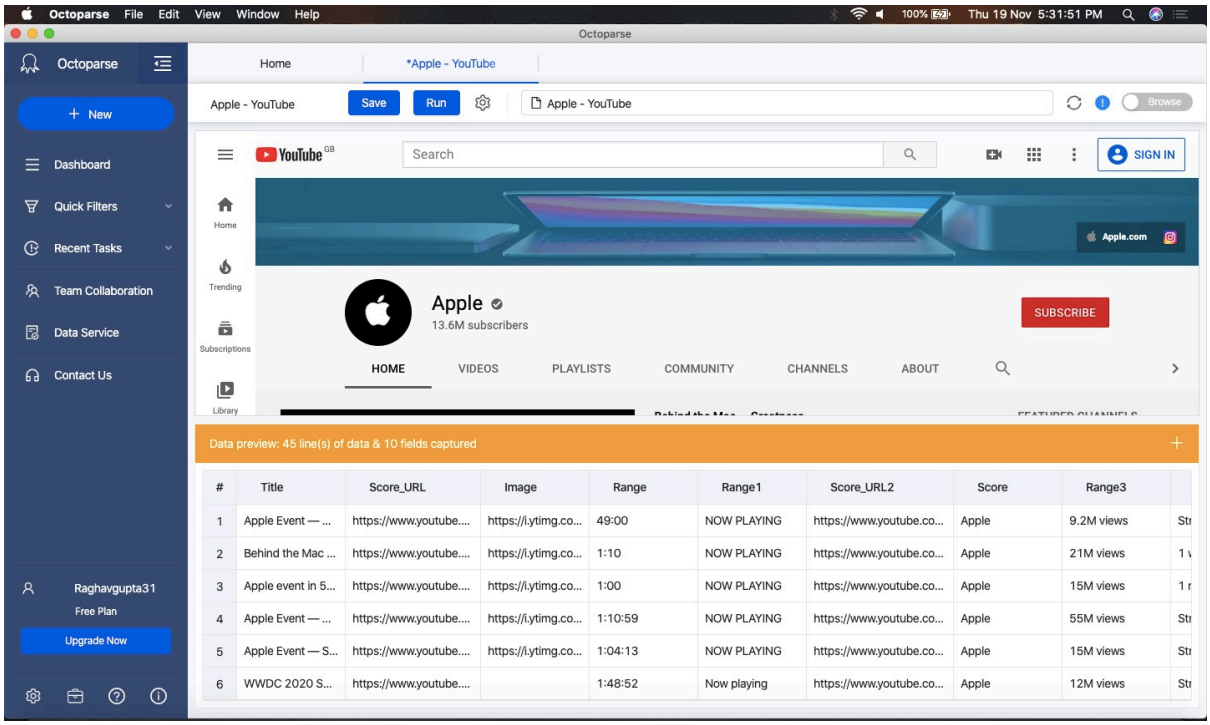

## A.2 Scraping Apple's Twitter data from data miner



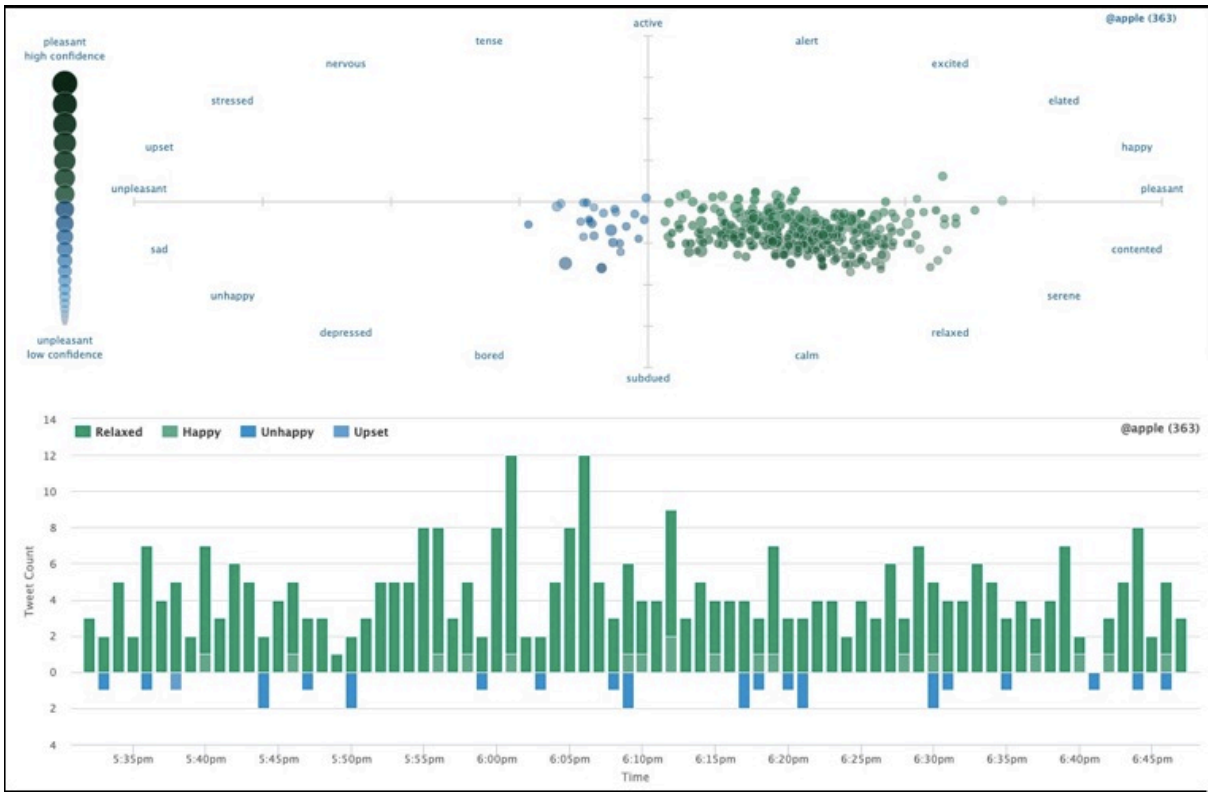
## A.3 Scraping Apple's Twitter data from scraper




## A.4 Scraping Apple's YouTube data from octoparse



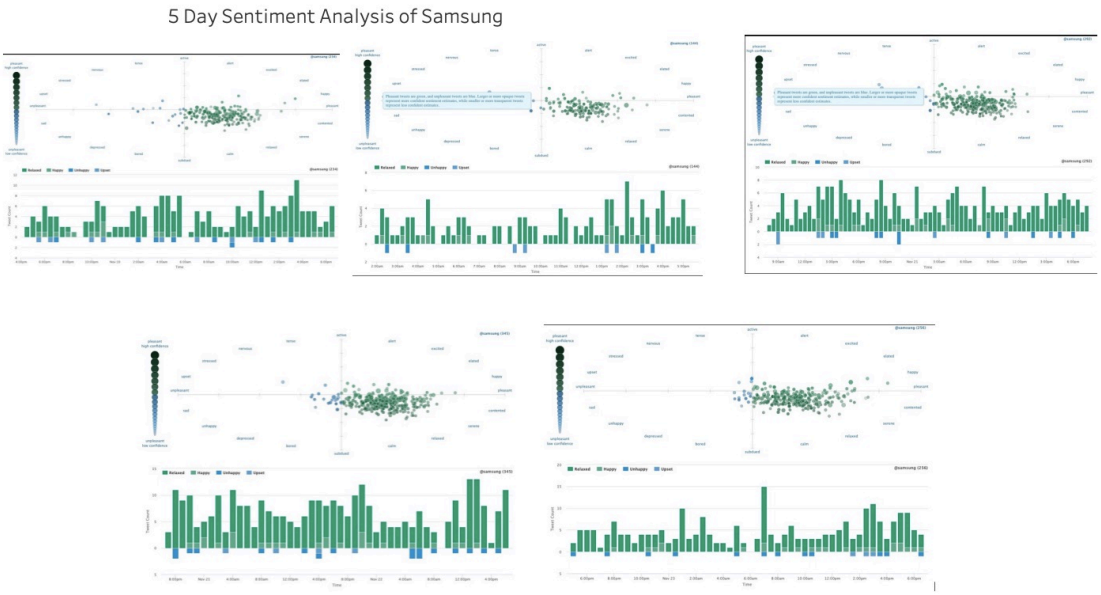
A.5 Sentiment analysis of Apple's tweets using sentiment Viz




A.6 Tableau link:
https://public.tableau.com/profile/raghav.gupta2884#!/vizhome/st20183508FinalAssesmentVisualization/VisualizationoninterestsofPeopleonInternetforLast5Years?publish=yes

A.7 5 day sentiment analysis on Apple's tweet

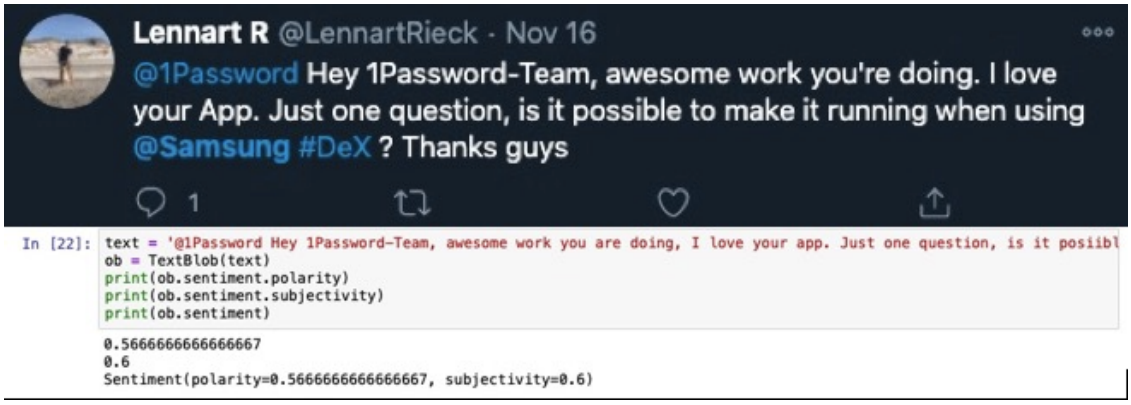
A.8 5 day sentiment analysis on Samsung's tweet




A.9 Apple's happy tweet analysis

A.10 Apple's unhappy tweet analysis


A.11 Samsung's happy tweet analysis




A.12 Samsung's unhappy tweet analysis