

Sentiment Analysis for E-commerce leaders

Amazon (B2C) and Alibaba(B2B)

Research Problem:

Sentiment analysis is a powerful marketing tool that allows product managers to understand customer emotions and incorporate them into marketing campaigns. It is a crucial element in product and brand recognition, customer loyalty, customer satisfaction, the success of advertising and promotion, and product acceptance. Understanding consumer psychology can assist product managers and customer success managers in making more precise changes to their product roadmap. The term "emotion-based marketing" refers to emotional customer responses such as "positive," "negative," "neutral," "negative," "uptight," "disgust," "frustration," and others. Understanding the psychology of customer responses can also help you improve product and brand recall.

As a result, the purpose of this report is to provide the largest e-commerce platforms with a more comprehensive view of their consumers' sentiments to meet their needs in the most effective ways possible. Further research is needed to understand the user's perspective on those platforms Amazon and Alibaba. Understand the issues both platforms face. Then use the word list to identify the most frequently used words in relation to Amazon and Alibaba.

Research Objective:

Practically, Twitter is used as a data source in this study, and RapidMiner is used as a tool for implementing the opinion/text mining analysis.

- (1) To examine the user's perception of Alibaba and Amazon
- (2) To explore the reasons behind Amazon and Alibaba sentiments.
- (3) To discover the topics that are discussed in the ecommerce industry associated with Alibaba and Amazon.

Research Questions:

Q1: How does the customer perceive each platform, is it a positive, negative or neutral perception?

Q2: What are the reasons behind those negative and positive sentiments for Alibaba and Alibaba Pro sellers, customers, and investors?

Q3: What are the reasons behind those negative and positive sentiments for Amazon and Amazon Prime customers?

Q4: What are the top topics discussed in Alibaba and Alibaba Pro's tweets from the wordlist analysis?

Q5: What are the top topics discussed in Amazon and Amazon Prime's tweets from the wordlist analysis?

Research Design:

As mentioned earlier, customers' opinions are impactful. Opinions shared by customers are what build a solid international company or push companies to run out of business. That is why companies focus on their customer satisfaction and try to keep up with their customers' expectations. Fortunately, customers share their satisfaction, expectations, and recommendations all on social media. Unfortunately, the amount of data is huge, yet it is undeniably important to tackle the analysis of these microblogs. Obviously, opinions are the spark that starts sentiment analysis.

The Five main sentiment analysis processes are data collection, data pre-processing, sentiment classification, text pre-processing and data visualization.

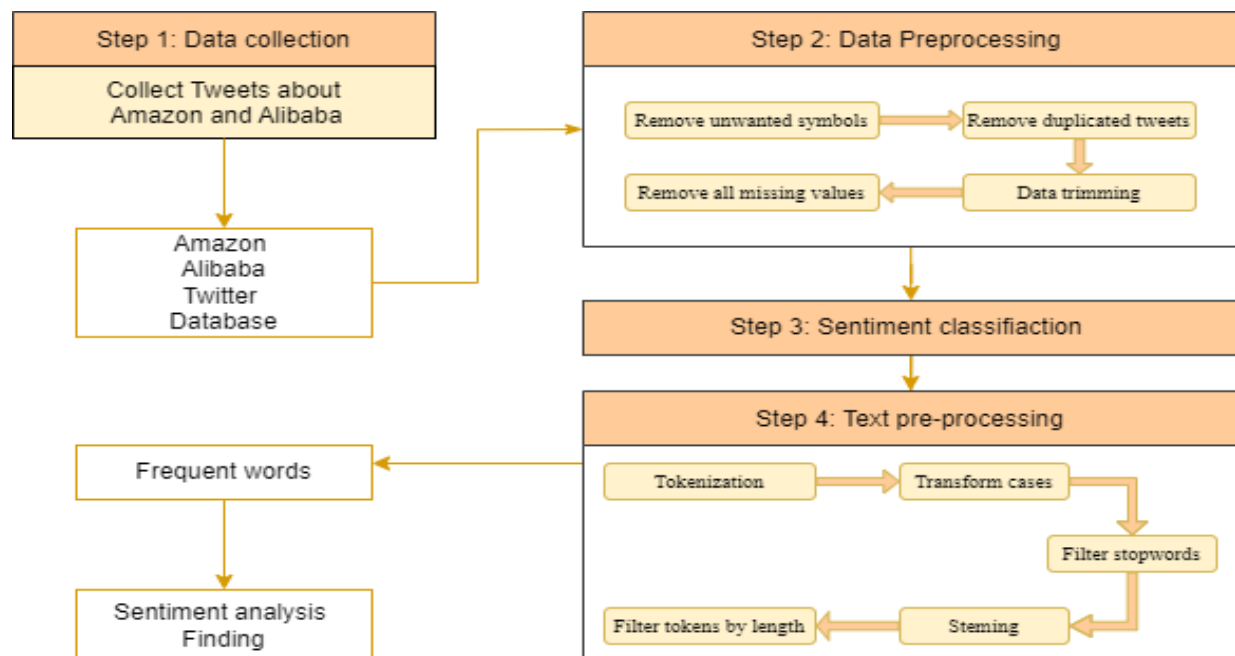


Figure (1): Flow Chart of the Sentiment Analysis process for Amazon and Alibaba

3.3.1 Data Collection

In this research, data collected from Twitter, exactly 2000 raw Tweets were collected for each, Alibaba, and Amazon. The tweets are in English and recent. It is about each corporation separately, using the search Twitter operator in RapidMiner. It is shown below in Figure 2 and applied to Amazon as well. Keywords used for search query in Twitter are “Alibaba”, “Amazon + shopping”, “Amazon + prime” and “Alibaba + pro”



Figure (2)

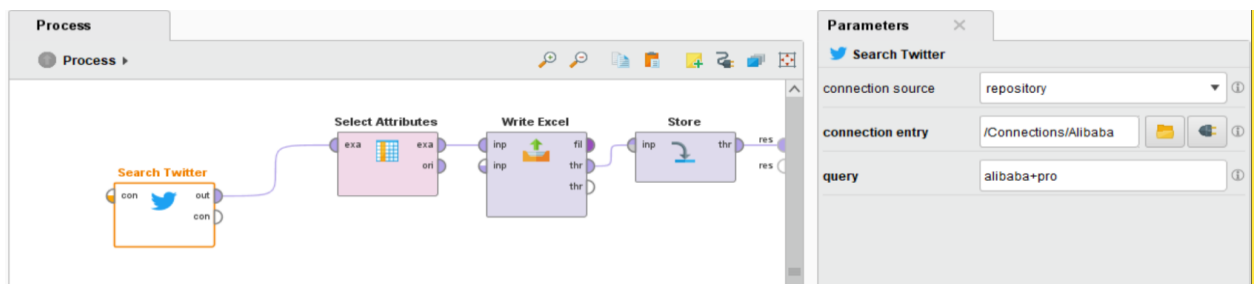


Figure (3)

Findings:

In this section, sentiment analysis, cloud word, and topic modeling results will be discussed reflecting on the industry. Through analyzing fetched raw data in English from Twitter with a limit of 3000 tweets. Alibaba pro has raw data of 49 rows. Amazon and Amazon prime have raw data of 2995 rows and both are reduced to 2965 after cleaning.

Firstly, sentiment analysis and word cloud which are conducted for this raw data independently, resulting in sentiment overview in a pie chart and word overview in a word cloud.

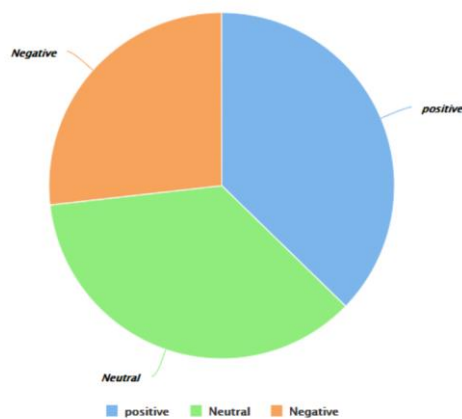


Fig (1): Sentiment Analysis output for Alibaba

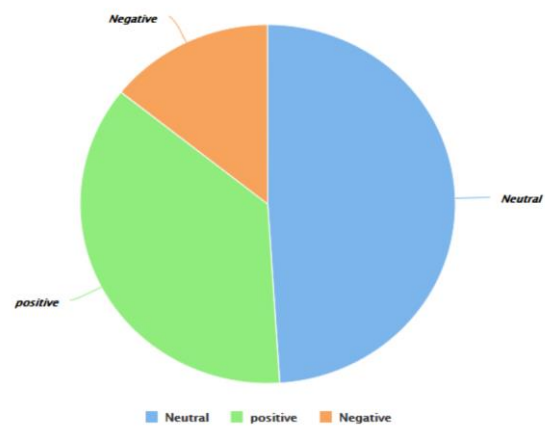


Fig (2): Sentiment Analysis output for Alibaba Pro

The pie chart figures above represent an overview of the sentiments analysis of both Alibaba and its seller service which is called Alibaba Pro or Alibaba Pro Buy. In addition to, Amazon and its sellers service called Amazon Prime.

In figure (1), From 381 rows for Alibaba, the sentiment analysis overview results are as follows. The result of each negative, neutral, and positive sentiment is very close. The highest is positive about 37% (142), then neutral with 35.9% (137), finally negative with 26.8% (102). On the other hand, Alibaba Pro with 49 rows. In figure (2), From 49 rows of Alibaba Pro, the results were the highest is positive with 48.9% (24), then neutral with 36.7% (18), and negative comes last with 14% (7).

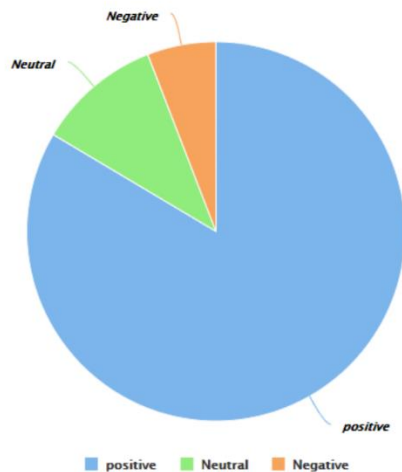


Fig (1): Sentiment Analysis output for Amazon

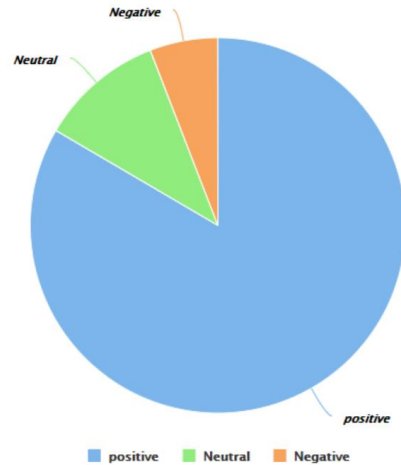


Fig (2): Sentiment Analysis output for Alibaba Pro

For Amazon and Amazon Prime from 2965 rows, the sentiments analysis results shown in figures (1) and (2) are as follows. In figure (1), the highest and the majority is the positive sentiment with 83.5% (2477), then neutral with 10.5% (314), lastly negative with 6% (174). On the sellers' side, the results are the same! We suspect that most of the tweets has the key words Amazon, prime and shopping, however, this has high probability or possibility due to prime day!



Fig (1): Amazon Positive Word Cloud



Fig (2): Amazon Negative Word Cloud



Fig (1): Amazon Pro Positive Word Cloud



Fig (1): Amazon Pro Negative Word Cloud

Turning the spotlight to Amazon and Amazon Pro. As the sentiment figures represent Amazon are same as Amazon prime with insignificant change of less frequency in Amazon Pro. We could say they were typical especially in positive which is clear by comparing them by looking. However, we find for sure amazon among the top words exceeding 1000, so we have added a filter to take out the word amazon, to be able to see the other words more clearly. In the positive, we found the word gift is frequently used in addition to support, free, support, and love. On the other hand, the negative in Amazon is drop, scam, forget and low and add to them difficult.

Shifting our focus to word list or words generate, we wanted to discuss the most frequently mentioned words regardless of their sentiment to include the neutral sentiment with high frequency. Because neutral sentiment helps to introduce the topic and we find them a sign of concern as they can turn into negative or positive. In addition to the fact that this will give us a chance for getting new insights differ from the word cloud insights and have a deeper analysis where both insights could help us in reasoning the results. We chose the top 20 words to cover as much insights as possible comparing both of customers and sellers' aspects of each.

	Alibaba			Alibaba pro		
	Word	In Documents	Total	Word	In Documents	Total
1	alibaba	220	228	alibaba	35	35
2	china	40	42	baba	24	24
3	bui	24	25	aicl	22	22
4	cloud	15	20	pro	12	12
5	tech	18	19	stock	12	12
6	amazon	18	18	why	11	11
7	electr	10	17	nio	4	7
8	sell	16	17	pdd	6	6
9	get	13	16	tencent	6	6
10	product	16	16	bui	4	5
11	busi	15	15	bili	4	4
12	compani	14	15	bilibili	4	4
13	look	15	15	contact	4	4
14	chines	13	14	dsp	4	4
15	follow	14	14	effect	4	4
16	fund	12	14	fine	4	4
17	sai	14	14	hong	4	4
18	valuat	11	14	june	4	4
19	etc	13	13	kong	4	4
20	freshippo	11	13	mixer	4	4

Table (1): Alibaba and Alibaba Pro word list

Alibaba and Alibaba pro word list has different words although it is about the same brand which is good for more insights. There are also common words as Alibaba and bui with different frequencies 220, 25 in Alibaba and 35, 4 in Alibaba pro. To cover as much insights as possible comparing both of customers and sellers' aspects of each.

	<i>Amazon</i>			<i>Amazon Prime</i>		
	<i>Word</i>	<i>In Documents</i>	<i>Total</i>	<i>Word</i>	<i>In Documents</i>	<i>Total</i>
1	<i>shop</i>	<i>1999</i>	<i>2793</i>	<i>shop</i>	<i>2002</i>	<i>2798</i>
2	<i>amazon</i>	<i>1668</i>	<i>2032</i>	<i>amazon</i>	<i>1666</i>	<i>2026</i>
3	<i>deal</i>	<i>1084</i>	<i>1328</i>	<i>deal</i>	<i>1090</i>	<i>1333</i>
4	<i>gift</i>	<i>463</i>	<i>899</i>	<i>gift</i>	<i>464</i>	<i>900</i>
5	<i>prime</i>	<i>640</i>	<i>712</i>	<i>prime</i>	<i>636</i>	<i>710</i>
6	<i>dai</i>	<i>607</i>	<i>691</i>	<i>dai</i>	<i>606</i>	<i>692</i>
7	<i>twitter</i>	<i>433</i>	<i>434</i>	<i>twitter</i>	<i>433</i>	<i>434</i>
8	<i>socialmedia</i>	<i>431</i>	<i>431</i>	<i>socialmedia</i>	<i>431</i>	<i>431</i>
9	<i>facebook</i>	<i>430</i>	<i>430</i>	<i>facebook</i>	<i>430</i>	<i>430</i>
10	<i>instagram</i>	<i>429</i>	<i>429</i>	<i>instagram</i>	<i>429</i>	<i>429</i>
11	<i>tumblr</i>	<i>420</i>	<i>420</i>	<i>tumblr</i>	<i>420</i>	<i>420</i>
12	<i>dress</i>	<i>141</i>	<i>401</i>	<i>dress</i>	<i>141</i>	<i>401</i>
13	<i>giftidea</i>	<i>388</i>	<i>388</i>	<i>giftidea</i>	<i>388</i>	<i>388</i>
14	<i>affiliatemarket</i>	<i>366</i>	<i>381</i>	<i>affiliatemarket</i>	<i>366</i>	<i>381</i>
15	<i>bitcoin</i>	<i>370</i>	<i>372</i>	<i>bitcoin</i>	<i>370</i>	<i>372</i>
16	<i>pinterest</i>	<i>334</i>	<i>334</i>	<i>pinterest</i>	<i>334</i>	<i>334</i>
17	<i>bui</i>	<i>256</i>	<i>318</i>	<i>bui</i>	<i>253</i>	<i>315</i>
18	<i>dogecoin</i>	<i>288</i>	<i>290</i>	<i>dogecoin</i>	<i>288</i>	<i>290</i>
19	<i>doge</i>	<i>286</i>	<i>286</i>	<i>doge</i>	<i>286</i>	<i>286</i>
20	<i>get</i>	<i>245</i>	<i>264</i>	<i>get</i>	<i>255</i>	<i>274</i>

Table (1): Amazon and Amazon Prime word list

Unlike Alibaba and Alibaba Pro, Amazon and Amazon prime has the same word with insignificant different in frequencies. It is clear the top word is shop which may be affected by the keyword choice as the key word for Amazon was Amazon + shopping to drive out tweets about other services as cloud and so on, Although the same word is top in amazon prime which its twitter search keywords were Amazon + prime. The word bui is mentioned here too. In addition to other words that will be discussed in the next section.

4. Discussion: -

In this section, we are going to discuss all the findings and dig deeper to answer our research questions which are:

Q1: How does the customer perceive each platform, is it a positive, negative or neutral perception?

Q2: What are the reasons behind those negative and positive sentiment for Alibaba and Alibaba Pro sellers, customers, and investors?

Q3: What are the reasons behind those negative and positive sentiment for Amazon and Amazon Prime customers?

Q4: What are the top topics discussed in Alibaba and Alibaba Pro's tweets from the wordlist analysis?

Q5: What are the top topics discussed in Amazon and Amazon Prime's tweets from the wordlist analysis?

First things first, we have to discuss the collected data or the raw data that has varied for each Alibaba and Amazon, especially as we filtered by English. For example, the number of tweets has Alibaba is 799 but after filtering to the tweets in English only, it has reduced to 381, as well as, Alibaba pro which is reduced from 72 to 49 upon filtering to English. Unlike Amazon which is not affected by the filtering. This is somehow expected. According to Statista's last report about Twitter users and Business report about Amazon and Alibaba, the United States has about 76.9 million Twitter users where Amazon is dominating, and the English language is the first language. On the other hand, Alibaba is dominating in China and Asia region where English is not the first language. However, the total raw data analysed for Alibaba 1,074 rows while raw data analysed for Amazon are 2995 for each Amazon and Amazon prime. In a nutshell, the data fetched for Alibaba is lesser than amazon because of it is from twitter and in English.

Secondly, the two e-commerce platforms have different business plans. Alibaba has a Business-to-business (B2B) business plan that's why we focused on analyzing all of its customers then scoped the search for its sellers who are known as Alibaba Pro buy. Alibaba's analysis focus on the sentiment about the platform and its sellers' points of views giving reasons to the negative, and positive sentiments by show cases from the top sentiment examples supported by the cloud word. An incident that happened this year caught our attention to present the investors sentiment regarding Alibaba. Shifting the spotlight to Amazon, Amazon business plan is business-to-customers (B2C) That's why we focused on customers and wanted to narrow down our focus to the most loyal type of them which is Amazon Prime. we found our findings suspicious as they were typical. So, we dug deeper to find the reason which is declared later and analyzed thoroughly with the other findings. To answer the sentiment analysis and its reasons questions.

Thirdly, the wordlist analysis where we started with cleaning the data to get meaningful words and conducted frequency analysis to find the top and most frequently used words. We have presented them in the findings section in the word clouds separating the positive and negative words. Then we listed the top 20 words of the analysis with highest frequency regardless of their sentiment. To answer questions about the most related topic discussed or mentioned with each platform.

Q1: How does the customer perceive platform, is it a positive, negative or neutral perception?

Q2: What are the reasons behind those negative and positive sentiment for Alibaba and Alibaba Pro sellers, customers, and investors?

The sentiment overview enabled us to compare the overview sentiment of customers and sellers about Alibaba and Amazon in the following section, answering our question about whether the sentiment is positive, negative or neutral. On the other hand, the word cloud helps us dig deeper in the sentiment analysis to get the most repeated words and has build intuition and more sense about the sentiment overview.

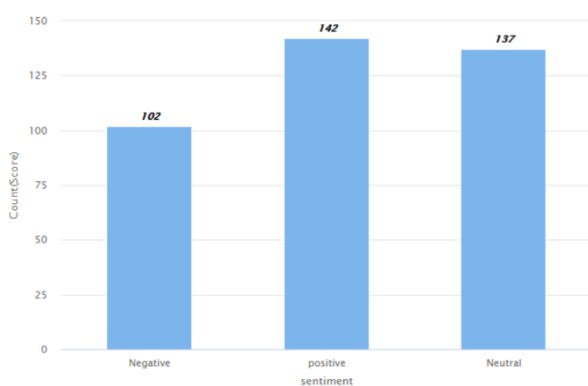


Fig (X): Sentiment Analysis output for Alibaba

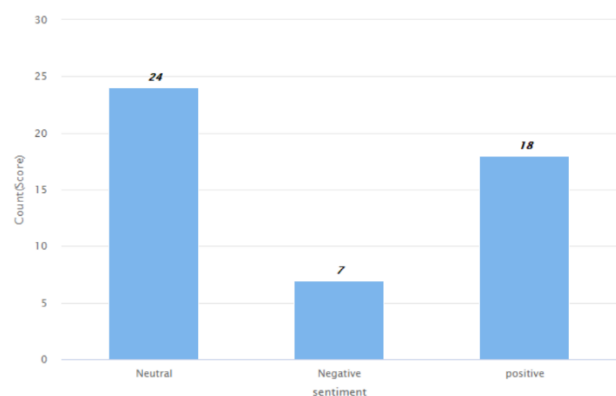


Fig (X): Sentiment Analysis output for Alibaba Pro

In figure (), it is clear that the highest sentiment for Alibaba is positive, one of the highest positive was praising the technology behind the platform saying “Alibaba .. uses Ai algorithm .. that helps in recommending products to customers”. Others recommend Alibaba saying “If you want a cheap vehicle download Alibaba you can its amazing what you can find vehicle wise there that you can pay through Western Union”. Here it also showed that the payment options such as western union is giving positive response as well as Pi which has drawn attention to Alibaba “just added Pi as means of payment Aliexpress”. On the other hand, the neutral sentiment is close to the positive one that’s why it is a little bit concerning as it may turn into negative or positive later on. Tackling the negative sentiment we found that users highest negative was because of a leak of customers information from one of Alibaba servers which arises an concern saying “Gigantic civilian data leak if confirmed A hacker is selling an alleged Shanghai police data leak containing 1 billion Chinese nationals

names home addresses ID phone criminal records etc Hacker says its from an Aliyun Alibaba private cloud server”, but this is not the only concern customers shows in their privacy as some cursed Alibaba cookies and others stated tweets like “Dont believe it Inch by mile our freedoms are being stolen Example Alibaba Group president J Michael Evans boasted at 22 World Economic Forum about the development of an individual carbon footprint tracker to monitor what you buy what you eat and wherehow you travel”. One of the negative cases is ethical which is “ExAlibaba employee says exboss should be charged with rape”.

Those sentiment examples overlap with the word cloud as the word recommend was there in the positive and the word rape with in the negative cloud. This sentiment analysis has made it clearer why these words are mentioned with high frequency. To sums up, the highly positive sentiments was about recommending Alibaba because of its prices and available payment options. The highly negative ones were about the privacy concerns and the ethical rape case.

On the other hand, Alibaba pro highest sentiment is neutral next to it positive sentiment which shows that Alibaba sellers consider themselves entrepreneurs and has established their own community as one of the highly positive sentiments said “It was nice to connect with likeminded entrepreneurs during the networking night of Alibaba ...”. Even one of the top negative sentiments has been about advising each other such as “If youre selling the same product that anyone else can get on Alibaba youre in danger of going out of business Thats why you have to be unique in some way because its hard to compete with other sellers that sell the same item at a much lower price” which is quite interesting. Another one was about admitting that Alibaba has lower prices “I am loathe to admit this but Alibaba is actually quite cheap It sources from many European companies and if you can buy in small bulk amounts it’s downright ridiculously cheap And you can resell them easily on Amazon at very very low prices”. Now, it is clear that Alibaba’s focus on selelrs has been reaping its fruits with good sentiment.

However, the concerning negative sentiments was about Alibaba for being charged with a fine due to not reporting acquisition with other big companies as Tencent and Bilibili. This incident has affected the stocks puzzling some of the investors as one of the tweets said “Why Alibaba Bilibili and Pinduoduo Are Falling Today” and other investors accused Alibaba of being scam saying “I’d rather lose money investing in prous company than buy Alibaba tencent or whatever other scam Chinese company”. Which indicates that some investors have bearish sentiment -feeling the market declining- while the positive sentiment shows that most of them have a rather bullish sentiment. While the neutral sentiment is noticeable indicating the need of a solution if there is, this sentiment overlaps with Nasdaq’s article titled “Chinese Regulator Penalizes Alibaba, Tencent & Bilibili” and explains the context of the most frequent negative words as scam and drop.

Q1: How does the customer perceive platform, is it a positive, negative or neutral perception?

Q3: What are the reasons behind those negative and positive sentiment for Amazon and Amazon Prime customers?

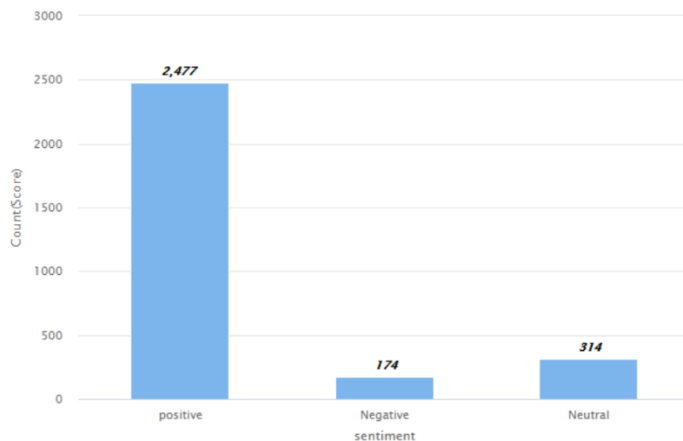


Fig (X): Sentiment Analysis output for Amazon

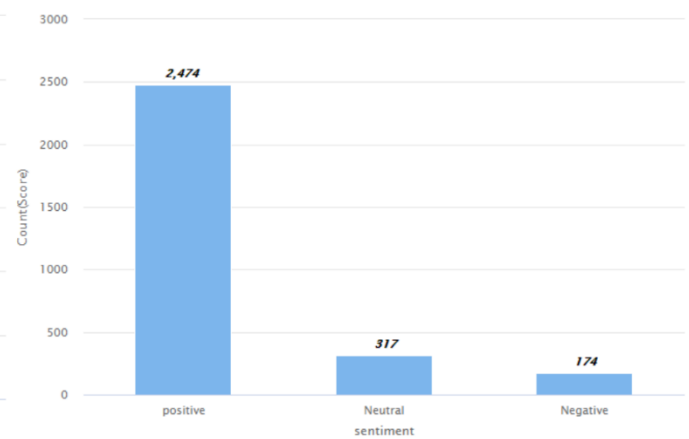


Fig (X): Sentiment Analysis output for Amazon prime

These two graphs are almost identical. So we suspected that the 2000+ most recent and popular tweets on twitter have both amazon and prime mentioned in same tweet. We believe our suspicion is true due to Amazon prime day. To know about Amazon prime day, it is 48 sales event on Amazon. That's why the word cloud shows the word gift as the one with highest frequency in positive section. Regarding the top positive sentiment tweet "Amazon Prime day is July 1213 While shopping why not support a great cause Sign up for Amazon Smile and choose The Bundle of Joy Fund as your charity of choice 05 of your eligible purchases will go directly to our foundation."; this is a smart move from Amazon to link shopping on its platform with a charitable cause using Amazon Smile and help its sellers by attracting new customers to be part of this good cause and personalise a sales event for its most loyal customers and even name it as Amazon Prime day. The hype this event get is not a joke at all as one of the top sentiment tweets describe it saying "Free shipping on millions of items ... Enjoy low prices and great deals ...". This sentiment shows us why the word cloud was full of support, gift and more.

On the other hand, the negative sentiment is kind of detailed. Starting with feedback of their new design of the application "Amazon ... I am already hating the look and feel of the app..." which may push Amazon to reconsider a sentiment analysis of their application design. Another one is about the bad customer service saying "Once again Amazon has failed to deliver the commitment resulting ... their CSR are talking very rude I request to avoid shopping on this website" it is quite understandable to find cases like this but amazon as a very personalised platform should update their strategy on handling these sentiments. Amazon should also try to focus on this concern of customers saying "Beware of Amazon Prime Day phishing scams More info about phishing scams"; Phishing scam means taking the personal information in attempt of hacking which is usually active in sale events as Prime Day. Another concern is about the bad deals for example one of the customers complained

that “you have Amazon Prime Days in the UK keep it in your basket check back it may go back down again” which is currently investigated according to this popular tweet “Amazon investigated over concerns its shopping service give consumers bad deal” which is true as MSE news stated that the Competition and Markets Authority (CMA) is probing whether Amazon is providing an unfair advantage to its own retailers and those third parties that use its logistics and delivery services. Those also overlaps with the word cloud that has scam, crime and forget as top frequently negatively mentioned words.

In a nutshell, the high positive sentiment is due to the deals, sale, gifts and free shipping offers from Amazon which is promoted by its own Prime customers. While the negative sentiment is due to application design, customer services, scam, and unfair competition.

Q4: What are the top topics discussed in Alibaba and Alibaba Pro’s tweets from the wordlist analysis?

	<i>Alibaba</i>			<i>Alibaba pro</i>		
	Word	In Documents	Total	Word	In Documents	Total
1	alibaba	220	228	alibaba	35	35
2	china	40	42	baba	24	24
3	bui	24	25	aicl	22	22
4	cloud	15	20	pro	12	12
5	tech	18	19	stock	12	12
6	amazon	18	18	why	11	11
7	electr	10	17	nio	4	7
8	sell	16	17	pdd	6	6
9	get	13	16	tencent	6	6
10	product	16	16	bui	4	5
11	busi	15	15	bili	4	4
12	compani	14	15	bilibili	4	4
13	look	15	15	contact	4	4
14	chines	13	14	dsp	4	4
15	follow	14	14	effect	4	4
16	fund	12	14	fine	4	4
17	sai	14	14	hong	4	4
18	valuat	11	14	june	4	4
19	etc	13	13	kong	4	4
20	freshippo	11	13	mixer	4	4

Table (1): Alibaba and Alibaba Pro word list

As shown in table (), it is logical to have the word Alibaba mentioned on the top yet the word amazon which indicates a comparison set by customers. However, China is the second highest in Alibaba which indicates that it is dominating there and because Alibaba

is a Chinese company after all. The word bui is referring to an origin of products where its suppliers and manufacturers are quite well -known on Alibaba platform which is mentioned in both Alibaba and Alibaba Pro. The Alibaba technology, and cloud has been discussed, maybe because of the hacking Alibaba suffered from as mentioned above. The last word is Freshippo which is a high-tech grocery chain owned by Alibaba and is successfully growing.

Alibaba pro top words, that are connected, are Baba which what is called about the Alibaba stocks and then the word stock, Tencent, and Bilibili which were charged a fine by Chinese government as mentioned in sentiment analysis. AICL or AICLE as mentioned in its most recent tweet “BABA NEW AICLE Exclusive Alibas Freshippo seeks funds at much lowered 6 billion valuation sources” is correlated with Alibaaba’s funds, and stocks. While nio, pdd, dps, bili, mixer is like bui, they are a product or manufacturer/supplier of a certain product that is sold on Alibaba, which is mentioned on Twitter but most with frequency between 4 and 6.

In a conclusion, the top topics are about Alibaba’s origin (China), and one of its manufacturers (bui), then its technology and product, lastly its supermarket (Freshippo). While Alibaba’s pro topics were about recent charged fine case, stocks, and suppliers.

Q5: What are the top topics dicussed in Amazon and Amazon Prime’s tweets from the wordlist analysis?

Amazon			Amazon Prime		
	Word	In Documents Total		In Documents Total	
1	shop	1999 2793	shop	2002 2798	
2	amazon	1668 2032	amazon	1666 2026	
3	deal	1084 1328	deal	1090 1333	
4	gift	463 899	gift	464 900	
5	prime	640 712	prime	636 710	
6	dai	607 691	dai	606 692	
7	twitter	433 434	twitter	433 434	
8	socialmedia	431 431	socialmedia	431 431	
9	facebook	430 430	facebook	430 430	
10	instagram	429 429	instagram	429 429	
11	tumblr	420 420	tumblr	420 420	
12	dress	141 401	dress	141 401	
13	giftidea	388 388	giftidea	388 388	
14	affiliatemarket	366 381	affiliatemarket	366 381	
15	bitcoin	370 372	bitcoin	370 372	
16	pinterest	334 334	pinterest	334 334	
17	bui	256 318	bui	253 315	
18	dogecoin	288 290	dogecoin	288 290	
19	doge	286 286	doge	286 286	
20	get	245 264	get	255 274	

In Table (), it is expected that shop and amazon would be top as they are the keywords. Following them deal, gift, and prime due to Prime Day event. Dai is a product sold on amazon, and amazon music as it is a Vietnamese classical word and there is release of a music album with dai; just like dress. However, most of the social media is mentioned in relation to amazon as Facebook, Instagram, Tumblr, Pinterest, and Twitter which is quite logical because those where Amazon contact and reach its customers. Anyways, an interest word as affiliate market has been mentioned. Amazon's affiliate marketing program give content creators, bloggers, and marketers a chance to monetize their site visitors by promoting Amazon products. It works like this the associates gets commission whenever a buyer clicks on the Amazon link that is seen on the associate's website and purchase an item from Amazon. Finally, dogecoin and bitcoin has been in the context that Amazon has been accepting them as a payment option but there is no evidence that this true. As Investopedia mentioned that Amazon does not accept Bitcoin. And regarding dogecoin. It has been mentioned in Check Your Facts blog that Amazon spokesperson has claimed that this maybe due to a famous online petition that requesting adding dogecoin as a payment method in Amazon.

Simply, the top topics are the deals, offers, prime day. Followed by social Media channels and finally the cryptocurrencies rumor.

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