

Twitter Sentiment Analysis and Its Effect on Society on the Fall of Cryptocurrency

Hafiza Oktasia Nasution¹, Henni Noviasari², Salhazan Nasution³, Lisa Melinda⁴

Department of Business Economics, University of Riau^{1,2,4}

Department of Informatics, Engineering, University of Riau³

hafiza@lecturer.unri.ac.id¹, henni.noviasari@lecturer.unri.ac.id², salhazan@lecturer.unri.ac.id³,
lisa.melinda2235@student.unri.ac.id⁴

Article Info

Article history:

Received Jun 11, 2022

Revised Aug 21, 2022

Accepted Sept 21, 2022

Keyword:

Sentiment Analysis

Crypto crash

Twitter

Python

ABSTRACT

Cryptocurrency has become a global phenomenon nowadays. Based on the results of the GlobalWebIndex Survey, around 10% of internet users in Indonesia have digital currencies. But in recent years, the price of the cryptocurrency has fallen. It has resulted in people starting to hesitate to invest in crypto. This problem causes responses from the community, such as positive, negative, and neutral responses. This study aims to classify public opinion through the response to the fall of crypto by applying sentiment analysis through Twitter social media. Sentiment analysis data collection on Twitter uses the python programming language. There are three stages in the data analysis process: data crawling, preprocessing, and the results of classification and visualization. Based on research from sentiment analysis through social media Twitter, it was obtained that 57.9% produced a neutral value, 35.7% produced a positive value, and 6.4% produced a negative value.

© This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Corresponding Author:

Henni Noviasari

Management Study Program

Faculty of Economics Business, University of Riau

Bina Widya Campus, HR. Soebrantas Street Km 12,5 Simpang Baru Pekanbaru 28293, Indonesia

Email: henni.noviasari@lecturer.uir.ac.id

1. INTRODUCTION

Cryptocurrency, or digital currency, has become a global phenomenon in many countries, such as the United States, Japan, and China. In Indonesia, cryptocurrencies are still experiencing pros and cons in terms of regulation and the legality of their use. The Indonesian government, in this case, the Commodity Futures Trading Regulatory Agency (CoFTRA), is continuing to review and issue several regulations regarding cryptocurrency assets.

According to Gormantara (2020), sentiment analysis is a field of science that can build a system for recognizing and extracting opinions in text form using Natural Language Processing (NLP). With this sentiment analysis, sentences or words expressed through social media can be grouped into positive, negative, or neutral responses. In addition, this sentiment analysis can also be used to assess the conditions in the community and later can be used as a guide for making a decision or policy [2].

Sentiment analysis is highly developed and has been widely discussed in various research journals, including research conducted by Nurfidah Dwiyantri (2021) with the title "New Normal

Twitter Sentiment Analysis". This research aims to classify people's sentiments toward new habits or the New Normal using sentiment analysis. This research shows that positive sentiment is greater than negative and neutral sentiment. The results for the positive sentiment were 57%, the negative sentiment was 8%, and the neutral sentiment was 35% [3].

The current research is crawling data using the Tweepy library in Python. For classification, use the Textblob library in Python and for the search key on Twitter, use English. So based on the description above, the purpose of this research is the application of sentiment analysis to classify public views on the fall of crypto through social media Twitter into positive, negative, and neutral sentiments.

This research's expected benefit is knowing society's response to the fall of crypto. With this sentiment analysis, it is also a view for the public to be careful in investing public funds into crypto.

2. RESEARCH METHOD

2.1. Method of collecting data

The data collection method used in this research is collecting the sentiment of Twitter users with the hashtag crypto crash using Python. The stages carried out in this research consist of three steps: data crawling, preprocessing and classification results, and visualization of results. The description of the flow of the research is as follows:

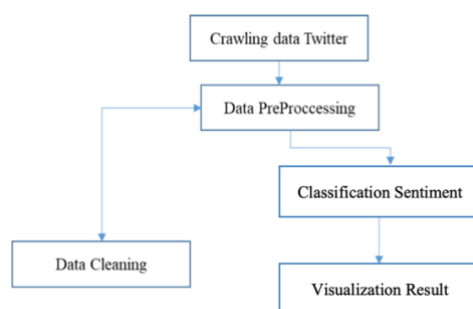


Figure 1. Sentiment Analysis Research Flow

Based on Figure 1 above, the first stage is to collect public opinion or views on Twitter social media. The second stage is cleaning the data before the data is analyzed further through filters to remove retweets containing duplication and res.sub to delete urls using regular expressions accessed from a predetermined character set and others. As for the classification of sentiment analysis in this study using the Textblob library in Python. The library identifies opinions in the text data about the subject in the form of sentiment (polarity, subjectivity).

2.2. Python

Python is one of the most widely used programming languages programmers or programmers in making their programs. Python has characteristics that are not too complicated. So that Python has become one of the languages Easy-to-use high-level programming. In writing a code program using the Python programming language, some rules must be followed to anticipate errors or problems in the program created. The first Python syntax rule is in writing statements or commands.

3. RESULTS AND ANALYSIS

The data collection results carried out in this study were from a tweet data crawler from the Twitter API using the Tweepy library. This Tweepy library makes it easy to get data on Twitter from users based on the keywords used. The keyword used is a variable with the hashtag crypto crash (#cryptocrash) using English in the last 30 days from 28th September 2022. An illustration of the results of the sample data crawling results can be seen in Figure 2.

```
[{'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 17, 35, tzinfo=datetime.timezone.utc),
  'pengguna': 'gierek_grzegorz',
  'isi': "There's a lot of room in the insurance industry for CheckDot to grow hiddengem cryptocrash crypto",
  'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 17, 20, tzinfo=datetime.timezone.utc),
  'pengguna': 'Jiro6Jiro',
  'isi': 'BTC market price TP 19500 SL 19000 ETH market price TP 1350 SL 1250 Pnl 90.4 Total Value 685 cryptocrash',
  'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 13, 21, tzinfo=datetime.timezone.utc),
  'pengguna': 'Oiribem976',
  'isi': 'RT @Danieladefi: Hoy es el aniversario de la caida del 29 de septiembre de 2008 SPX500 cryptocrash cryptocurrency Crypto Criptomoned',
  'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 12, 48, tzinfo=datetime.timezone.utc),
  'pengguna': 'm_lglm',
  'isi': "RT @takamiushi: Don't worry , WE CAN LIVE IN METAVERSE ! 🤖\n#Cryptocrash #BitcoinCrash https://t.co/CD8gDC2KM"},
 {'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 12, tzinfo=datetime.timezone.utc),
  'pengguna': 'KennedySermon',
  'isi': "RT @takamiushi: Don't worry , WE CAN LIVE IN METAVERSE ! 🤖\n#Cryptocrash #BitcoinCrash https://t.co/CD8gDC2KM"}]
```

Figure 2. Tweet Data Collection Results #cryptocrash

API.search_30_day can retrieve tweet data from the previous 30 days by querying #cryptocrash. With the standard API format, a maximum of 1 execution can only retrieve 100 tweets. Therefore, additional pagination is needed to retrieve 3000 tweets, namely tweepy.Cursor(method,*args,*kwargs) to produce 3000 tweets.

After collecting data, the next process is to process the data preprocessing Twitter data. The data preprocessing process that was done by cleaning the data includes deleting URLs and hashtags using regular expressions. In a function defined with: re.sub("([^\0-9A-Za-z\{t}) | | (\w+:\w+\S+) ", " " on tweet status. The function re.sub is used to replace the character selection specified using regular expressions, to find all strings, such as URLs and hashtags, replaced with -". The results of the preprocessing data process can be seen in Figure 3.

```
['There s a lot of room in the insurance industry for CheckDot to grow hiddengem cryptocrash crypto',
 'BTC market price TP 19500 SL 19000 ETH market price TP 1350 SL 1250 Pnl 90.4 Total Value 685 cryptocrash',
 'RT Hoy es el aniversario de la caida del 29 de septiembre de 2008 SPX500 cryptocrash cryptocurrency Crypto Criptomoned',
 ',
 ',
 'RT Don t worry WE CAN LIVE IN METAVERSE Cryptocrash BitcoinCrash',
 'RT Don t worry WE CAN LIVE IN METAVERSE Cryptocrash BitcoinCrash',
 'RT Don t worry WE CAN LIVE IN METAVERSE Cryptocrash BitcoinCrash',
 'RT Don t worry WE CAN LIVE IN METAVERSE Cryptocrash BitcoinCrash',
 'RT No Hype No Lies Just free global 100 send to you directly cryptocurrency cryptocurrency Crypto',
 'durftesolliciteren dts vacature cryptocrash Informatieanalist',
 'RT Hoy es el aniversario de la caida del 29 de septiembre de 2008 SPX500 cryptocrash cryptocurrency Crypto Criptomoned',
 ',
 ',
 'RT Bear flag followed by a bear flag Still waiting for my buy zone at 0.6 MATIC MATIC BTC BTC Bitcoin cryptocrash',
 'Bear flag followed by a bear flag Still waiting for my buy zone at 0.6 MATIC MATIC BTC BTC Bitcoin',
 'RT Me as a investor Cryptocrash',
 'durftesolliciteren dts vacature cryptocrash Onderhoudsmonteur machines installaties',
 'RT Hoy es el aniversario de la caida del 29 de septiembre de 2008 SPX500 cryptocrash cryptocurrency Crypto Criptomoned',
 ',
 ',
 'Nieuwe vacature cryptocrash Jurist',
```

Figure 3. Preprocessing Data Results

In addition, in the data preprocessing process, the process of changing all the letters in the tweet data into lowercase letters is also carried out with the set(lower_case) function. The results of the process of changing lowercase letters can be seen in Figure 4.

```
['there s a lot of room in the insurance industry for checkdot to grow hiddengem cryptocrash crypto',
 'btc market price tp 19500 sl 19000 eth market price tp 1350 sl 1250 pnl 90.4 total value 685 cryptocrash',
 'rt hoy es el aniversario de la caida del 29 de septiembre de 2008 spx500 cryptocrash cryptocurrency crypto criptomoned',
 ',
 ',
 'rt don t worry we can live in metaverse cryptocrash bitcoincrash',
 'rt don t worry we can live in metaverse cryptocrash bitcoincrash',
 'rt don t worry we can live in metaverse cryptocrash bitcoincrash',
 'rt don t worry we can live in metaverse cryptocrash bitcoincrash',
 'rt no hype no lies just free global 100 send to you directly cryptocurrency cryptocurrency crypto',
 'durftesolliciteren dts vacature cryptocrash informatieanalist',
 'rt hoy es el aniversario de la caida del 29 de septiembre de 2008 spx500 cryptocrash cryptocurrency crypto criptomoned',
 ',
 ',
 'rt bear flag followed by a bear flag still waiting for my buy zone at 0.6 matic matic btc btc bitcoin cryptocrash',
 'bear flag followed by a bear flag still waiting for my buy zone at 0.6 matic matic btc btc bitcoin',
 'rt me as a investor cryptocrash',
 'durftesolliciteren dts vacature cryptocrash onderhoudsmonteur machines installaties',
 'rt hoy es el aniversario de la caida del 29 de septiembre de 2008 spx500 cryptocrash cryptocurrency crypto criptomoned',
 ',
 ',
 'nieuwe vacature cryptocrash jurist',
```

Figure 4. Results of the Lowercase Change Process

After making the process of changing lowercase letters on the Twitter data, the final process at the stage of the data preprocessing process is to do a retweet filter. The retweet filter removes retweets that contain the same content (duplicates). The results of the retweet filter can be seen in Figure 5.

```
[{'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 17, 35, tzinfo=datetime.timezone.utc),
  'pengguna': 'gierek_grzegorz',
  'isi': 'there s a lot of room in the insurance industry for checkdot to grow hiddengem cryptocrash crypto',
  'polarity': 0.0,
  'sentimen': 'netral'},
 {'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 17, 20, tzinfo=datetime.timezone.utc),
  'pengguna': 'Jiro6Jiro',
  'isi': 'btc market price tp 19500 sl 19000 eth market price tp 1350 sl 1250 pnl 90 4 total value 685 cryptocrash',
  'polarity': 0.0,
  'sentimen': 'netral'},
 {'tanggal_tweet': datetime.datetime(2022, 9, 29, 3, 13, 21, tzinfo=datetime.timezone.utc),
  'pengguna': 'Oiribem976',
  'isi': 'rt hoy es el aniversario de la caida del 29 de septiembre de 2008 spx500 cryptocrash cryptocurrency crypto cript
  tomed',
  'polarity': 0.0,
  'sentimen': 'netral'},
```

Figure 5. Retweet Filter Results

After the data preprocessing process, the next step is the classification and visualization results. For sentiment analysis in this study, Textblob is used to identify public opinion on the fall of crypto from tweet data. The polarity value in sentiment analysis is between 1 to -1. The polarity value leading to a value of 1 indicates a positive opinion, the polarity value leading to a value of -1 indicates a negative opinion, and a polarity value ranging to 0 indicates a neutral opinion. The results of the sentiment analysis classification can be seen in Figure 6.

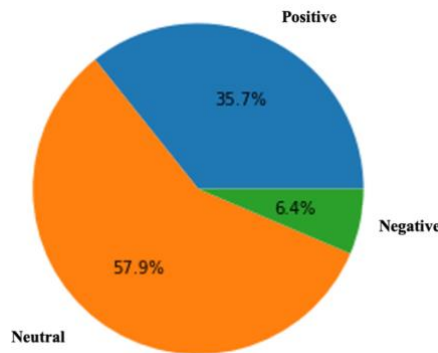


Figure 6. Sentiment Analysis Results

In Figure 6 above, it can be seen that the results of the sentiment analysis of the polarity value with the #cryptocrash variable. The highest polarity value is found in neutral status of 57.9%, positive polarity of 35.7%, and negative polarity of 6.4%.

To show some samples from the tweet data set from sentiment analysis with the #cryptocrash variable with positive, negative, and neutral categories and their polarity values, see Table 1.

Table 1. Tweet Polarity Category

Polarity	Tweet	Sentiment
-0.133	oax last few hours of gains get in get out green take 50 minimum 1 3 days or hold for take 100 maxim	Negative
-0.0571	give up trying to convince others that you are right as it is both exhausting and counterproductive memecoin cryp	Negative
0.0	i need some luck for this airdrop nftgiveaway	Neutral

0.0	nieuwe vacature cryptocrash callcentermedewerker inbound	Neutral
0.1666	no hype no lies just free global 100 send to you directly cryptocurrency cryptocurrency crypto	Positive
0.4499	flare is just around the corner going straight to 1st place lets be patient good things take time trending fla	Positive

4. CONCLUSION

Based on the results and discussion generated in this study, it can be concluded that the data used was obtained using the Tweepy library on Python by taking tweet data using the #cryptocrash variable from the last 30 days from 28th September 2022. From the data collected, there is a sentiment analysis result of 57.9% yielding a neutral value, a value of 35.7% producing a positive value, and 6.4% producing a negative value.

It is expected to extend this model by increasing the dataset and comparing our method with other machine learning in the future.

REFERENCES

- [1] Ammous, S. (2018). Can cryptocurrencies fulfil the functions of money? *The Quarterly Review of Economics and Finance*, 70, 38-51.
- [2] Andrianto, Y., & Diputra, Y. (2017). The Effect of Cryptocurrency on Investment Portfolio. *Journal of Finance and Accounting*, 5(6), 229-238.
- [3] Buntoro, G. A., Adji, T. B., & Purnamasari, A. E. (2014). Sentiment Analysis Twitter dengan Kombinasi Lexicon Based dan Double Propagation. *CITEE 2014*, 39-43.
- [4] Bhiantara, I. B. P. (2018). Teknologi Blockchain Cryptocurrency Di Era Revolusi Digital. *Seminar Nasional Pendidikan Teknik Informatika (SENAPATI)*, 9(September), 173–177. Retrieved from <http://eproceeding.undiksha.ac.id/index.php/senapati/article/view/1204>
- [5] Hameed, S., & Farooq, S. (2016). The Art of Crypto Currencies. *International*
- [6] A Harwick, C. (2016). *Cryptocurrency_and_the_problem.PDF*. *Independent Reveiw*, 20(4), 569–588.
- [7] *Journal of Advanced Computer Science and Applications*, 7(12), 426–435. <https://doi.org/10.14569/ijacsa.2016.071255>
- [8] Lee, D. K., Guo, L., & Wang, Y. (2018). Cryptocurrency: A new investment opportunity? *Journal Of Alternative Investments*, 20(3), 16-40.
- [9] Noorsanti, R. C., Yulianton, H., & Hadiono, K. (2018). Blockchain - Teknologi Mata Uang Kripto (Cryptocurrency). 306-311.
- [10] Nurhuda, F., & Sihwi, S. W. (2014). Analisis Sentimen Masyarakat terhadap Calon Presiden Indonesia 2014 berdasarkan Opini dari Twitter Menggunakan Metode Naive Bayes Classifier, 2(2).
- [11] M Prasetya, Adam, dkk. 2021, "Sentiment Analisis Terhadap Cryptocurrency Berdasarkan Comment Dan Reply Pada Platform Twitter", "Journal of Information Systems and Informatics", Vol. 3, No. 2, June 2021
- [12] Thakur, K. K., & Banik. (2018). Cryptocurrency: Its Risks And Gains And The Way Ahead. *Journal of Economics and Finance*, 9(2), 38-42.
- [13] Nurfidah, D., & Noni S. (2021). Analisis Sentimen Twitter Kebiasaan New Normal, *Seminar Nasional Riset dan Inovasi Teknologi (SEMNAS RISTEK)*, 14(Januari).
- [14] Fauziyyah, A. K. (2020). Analisis Sentimen Pandemi Covid19 Pada Streaming Twitter Dengan Text Mining Python. *Jurnal Ilmiah SINUS*, 18(2), 31. <https://doi.org/10.30646/sinus.v18i2.491>
- [15] Gormantara, A. (2020). Analisis Sentimen Terhadap New Normal Era di Indonesia pada Twitter Analisis Sentimen Terhadap New Normal Era di Indonesia pada Twitter Menggunakan Metode Support Vector Machine. July, 0–5.