Public Opinion on Lockdown (PSBB) Policy in Overcoming COVID-19 Pandemic in Indonesia: Analysis Based on Big Data Twitter

by Catur Suratnoaji

Public Opinion on Lockdown (PSBB) Policy in Overcoming COVID-19 Pandemic in Indonesia: Analysis Based on Big Data Twitter

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Abstract

The discourse on the lockdown in Indonesia is getting stronger due to the increasing number of positive cases of the coronavirus and the death rate. As of August 12, 2020, the confirmed number of COVID-19 cases in Indonesia reached 130,718. There were 85,798 victims who have recovered and 5,903 who have died. Data show a significant increase in cases of COVID-19 every day. For this reason, there needs to be an evaluation of the government policy of the Republic of Indonesia in dealing with the COVID-19 pandemic in Indonesia. An evaluation of policies for handling the pandemic must include public opinion to determine any weaknesses of this policy.

The development of public opinion about the lockdown policy can be understood through social media. During the COVID-19 pandemic, measuring public opinion through traditional methods (surveys) was difficult. For this reason, we utilized big data on social media as research data. The main purpose of this study is to understand public opinion on the lockdown policy in overcoming the COVID-19 pandemic in Indonesia. The things observed included: volume of Twitter users, top influencers, top tweets, and communication networks between Twitter users. For the methodological development of future public opinion research, the researchers outline the obstacles faced in researching public opinion based on big data from Twitter.

The research results show that the lockdown policy is an interesting issue, as evidenced by the number of active users (79,502) forming 133,209 networks. Posts about the lockdown on Twitter continued to increase after the implementation of the lockdown policy on April 10, 2020. The lockdown policy has caused various reactions, seen from the word analysis showing 14.8% positive sentiment, 17.5% negative, and 67.67% non-categorized words. Sources of information who have played the roles of top influencers regarding the lockdown policy include: Jokowi (the president of the

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Republic of Indonesia), online media, television media, government departments, and governors. Based on the analysis of the network structure, it shows that Jokowi has a central role in controlling the lockdown policy. Several challenges were found in this study: 1) choosing keywords for downloading data, 2) categorizing words containing public opinion sentiment, and 3) determining the sample size.

Keywords: public opinion, lockdown, social media, PSBB, big data, COVID-19

The discourse on the lockdown in Indonesia is getting stronger due to the increasing number of positive cases of the coronavirus and the death rate. As of August 12, 2020, the number of confirmed cases of COVID-19 in Indonesia had reached 130,718. Of these, 5,903 people had died and 85,798 had recovered. The data shows a significant increase in COVID-19 casualties every day. For this reason, there is a need for an evaluation of policies for handling the COVID-19 pandemic in Indonesia. The Indonesian government did not implement a total lockdown policy but adopted a regional lockdown policy. The Regional Lockdown Policy is known as "Pembatasan Sosial Berskala Besar" (PSBB), which can be translated as Large-Scale Social Restrictions and will be referred to as the lockdown policy in this paper.

The lockdown policy raises various opinions (positive and negative) because COVID-19 victims are increasing and many parties demand an evaluation of the implementation of the policy. In the policy evaluation process, an important factor is a consideration of public opinion on the implementation of the policy. However, measuring public opinion traditionally, i.e., via face-to-face interviews, during the COVID-19 pandemic is difficult to do because it is very dangerous for researchers. It is possible to collect data via Google form or telephone but this method is not effective because of a high refusal rate. Respondents in Indonesia tend to be willing to fill out a questionnaire if they know the research objectives and know the researcher well. Introductions between researchers and research subjects via telephone or Google forms tend to fail. One of the attempts to research public opinion during the COVID-19 pandemic is to focus on discussions of issues surrounding COVID-19 on social media. This is because social media plays an important role in spreading information about various issues concerning COVID-19. Measurement of public opinion based on social media big data is a rational approach and can be useful in the new normal era.

This research is focused on Twitter because Twitter is a form of social media that allows its data to be accessed by the public. This is unlike Facebook and Instagram, which have not allowed their data to be accessed by the public since the Cambridge Analytica case in 2018. The Cambridge Analytica case occurred in early 2018 when personal data from many Facebook users were taken without users' permission by Cambridge Analytica for political activities.

The researchers realize that the use of big data-based public opinion research methods is relatively new and presents methodological challenges. The data we observed included: Twitter user volume, Twitter media reach, top influencers, top tweets, and communication networks among Twitter users. For the development of research methods of public opinion in the future, the researchers will outline the challenges in implementing Twitter's big data-based research methods.

Research Methods

Measuring public opinion via polling asks the public directly about their opinion on an issue or event (Michael & Agur, 2018). Methodological polling is a technique to investigate what people think about an issue/problem that arises. Polls are conducted to find out how opinions developed in society regarding the issue. In the digital era, the measurement of public opinion no longer only uses surveys but can be based on public conversations on social media on certain issues (Stieglitz & Dang-Xuan, 2013). Public opinion research based on big data social media is still relatively new and is an exploratory type of research. Measurement of public opinion about the lockdown policy on social media Twitter is not carried out by the (traditional) survey methods but by using an online method due to the characteristics of big data (Manyika et al., 2011; Stieglitz & Dang-Xuan, 2013; Oussous et al., 2018). Technology based on big data is considered new and requires a precise method to manage large amounts of data that cannot be managed through traditional methods. Traditional research methods are unable to keep up with the main dimensions of big data's 3Vs, namely, volume (amount of data), variety (data variation), and velocity (speed of information) (Stieglitz & Dang-Xuan, 2013).

This study aims to understand the public's response to the lockdown policy in overcoming the COVID-19 pandemic in Indonesia. In addition, this study also looks at the challenges in the context of using big data. The measurement of public opinion does not only count the number of Twitter users, top tweets, top influencers, but also the communication networks among Twitter users. Several research concepts related to social media research include (Hansen et al., 2011): 1) Degree centrality, which is the number of connections a Twitter user has in discussing the issue of lockdown policy in Indonesia; 2) Closeness centrality, which is the average distance between users and all Twitter users when discussing lockdown policies; and, 3) Betweenness centrality, which is the centrality of charm, showing the position of a person or actor as an intermediary (betweenness) of relationships with other actors in a communication network among Twitter users. 4) Public opinion sentiment, which moves towards positive, negative, and neutral. In the NodeXl software, to categorize public opinion sentiment, variables are divided into three categories: positive, negative, and the non-categorized words. To get data in the positive sentiment category, the researcher entered 2005 positive and relevant keywords related to lockdown policies

such as acceptance, support, respect, admiration, appreciation, etc. To get negative sentiment data, researchers entered 4781 negative keywords such as refuse, worry, scold, fear, etc. Data that is not included in the positive and negative sentiment category will be included in the non-categorized words.

Research on social media research methods has been carried out by various experts in the social, economic, health, and political fields. Some of the research results using social media research methods include the political domain (Stieglitz et al., 2014) through prediction of election results; mapping of the strength of the Indonesian presidential candidates based on Twitter data (Suratnoaji, 2018); biomedical area (Kotsilieris et al., 2017); economics of business decision making (Rahmani et al., 2014); and consumer responses through social media sites (He et al., 2017). Thus, the rise of social media analytics as a process aimed at extracting useful knowledge from reported social data and social analysis. The important thing is not the big data itself, but the information it contains.

To download, process, analyze, and visualize research data, researchers used the NodeXL software. The first step in using this software is to determine the keywords to download Twitter data. This research was conducted in Indonesia, so the keywords use Indonesian words. The lockdown policy is in the Indonesian term for "Large-Scale Social Restrictions or PSBB", and the keywords used these words. Keyword selection is an important step in big data research on social media so that researchers get the right data according to research needs. If the researcher is wrong in entering the keyword, then there can be an error in downloading the data and in the end the data does not match the research needs.

The second step is to determine the research sample. Researchers in big data research do not take all the data in the population but take some of the data on Twitter social media. Liang and Zhu (2017) provide suggestions for taking purposive samples with consideration of convenience and prioritizing scientific standards. The consideration of convenience refers to the ability of the researcher in terms of cost, time, energy, and infrastructure. In addition, researchers also consider events or incidents of interest in a certain period of time (Liang & Zhu, 2017). Based on these considerations, the researcher decided to take periodic samples from April 9, 2020 to May 10, 2020. The reason for choosing this period was based on the date that the lockdown policy was implemented for the first time in Indonesia, on April 10, 2020.

The third step is to perform analysis using three levels of analysis, including: 1) content analysis, 2) behavioral data analysis, and 3) network structure data analysis. In general, three types of data were available for download on social media platforms. The first type is content data, which contains tweets, retweets, replies, and mentions from Twitter users. The second type is Twitter user behavior data in the form of opinion direction or opinion sentiment towards the lockdown policy. The third type is

network structure data, namely the communication network among social media users in discussing lockdowns.

Results

This study begins with understanding the number of Twitter users who talk about lockdown policies in Indonesia. The number of Twitter users determines the characteristics of public opinion. Public opinion that is formed from Twitter users on a small scale (volume), will be denser than the large scale. High density will accelerate the crystallization of public opinion because each individual has the opportunity to discuss with one another. Density shows the intensity between Twitter users in communicating. Public opinion that is formed from high density is reflected in the relationship between Twitter users and each other. Conversely, public opinion that is built on low density is characterized by minimal interaction between Twitter users, uneven interaction, or only dominated by certain Twitter users. Density can be measured by comparing the number of unique edges that will occur with the number of possible connections (unique edges) that will emerge. In calculating density values, the number of *edges with duplication* is omitted. *Edges with duplication* is a relationship that occurs between Twitter users and themselves. The *Edges with duplication* is unfavorable for public opinion research because research results can be biased. Therefore, to obtain research results with improved reliability and validity, duplication relationships are eliminated in the research. NodeXL software provides facilities to delete duplicate relationships to get valid research results. Density figures range from 0 to 1, where the greater the density value indicates the higher the cohesiveness of public opinion. In detail, the aspects of the relationship between Twitter users can be seen in the following table.

Table 1

Network of Twitter Users Discussing Lockdown Policies

Number	Graph Metric	Value
1.	Graph Type	Directed
2.	Vertices	79,502
3.	Unique Edges	133,209
4.	Edges With Duplicates	21,801
5.	Total Edges	155,010
6.	Maximum Geodesic Distance (Diameter)	17
7.	Average GeodesicDistance	4.307769
8.	Graph Density	0.00002001

Table 1 shows that the number of Twitter users talking about the lockdown is 79,052 vertices, so the possibility of a relationship (unique edges) being formed between Twitter users is 6,249,139,652. Meanwhile, the number of really unique edges was 133,029. Thus, the density value in this research was 133,029:6,249,139,652 = 0. 00002001. The meaning of the number 0.00002001 indicates very low density, and this tends to inhibit the crystallization of public opinion. This is due to the characteristics of Twitter media users who do not know each other, the number of open and large-scale Twitter users, and heterogeneous user backgrounds. In contrast to Facebook users, the formation of public opinion is relatively easy to coalesce because Facebook members are relatively familiar with each other and the volume of Facebook groups is small. The trend of discussing lockdown policy issues over time changes and determines network density. This can be seen in Figure 2, which shows that the trend of lockdown policy talks in Indonesia was unstable in the study period. Based on data findings, on April 11, 2020, there was an increase in the trend of lockdown policy talks in Indonesia. A tweet appeared that day because it was driven by the experience of Twitter users in experiencing the lockdown policy. The implementation of the lockdown policy on the second day showed that there were several violations, and this caused a reaction from Twitter users in Indonesia. Groups have relatively homogeneous backgrounds.

The trend of discussing lockdown policy issues from time to time changed and determined network density. This can be seen in Table 2, showing the trend of lockdown policy talks in Indonesia during the study period. On April 9, 2020, one day before the implementation of the lockdown policy, the number of tweets was 18,174. On April 10, 2020, when the policy was first implemented, the number of tweets decreased drastically to 4,277. One day after the implementation of the policy, the number of tweets increased sharply to 21,151. The number of tweets on that day was driven by the experience of Twitter users in experiencing the lockdown policy. They had to stay at home and if they wanted to leave the house, they had to have the permission of the officers guarding the lockdown policy. The number of tweets increased again on the second day due to many new facts related to community violations of the lockdown policy in Indonesia. The development of the number of tweets related to the policy can be seen in Table 2.

Table 2

Development of the number of tweets before and after the lockdown policy

Date	Sum of Tweets
April 8, 2020	1,676
April 9, 2020	18,174
April 10, 2020	4,277
April 11, 2020	21,151
April 12, 2020	21,529

The number of tweets on the second day was due to the actual experience of Twitter users with the lockdown policy. They had to stay at home for 14 days and no citizens were allowed to leave the house without the permission of the officers guarding the lockdown policy. The implementation of the policy on the second day showed several violations. and this caused a reaction from Twitter users. An increase in public opinion related to the implementation of the lockdown policy was because the public considers this issue to be very important in their lives. There is a significant correlation between issues on Twitter and issues in society. What issues are considered important in society will also go viral on Twitter. Public opinion will easily crystallize if the issues are closely related to the interests of the public at large. With NodeXL analysis, the progress of the lockdown talk issue can be seen in a time series based on the hour, day, week, month, and year. This can be seen in the following Figure 1.

Figure 1

Trend of PSBB Response on Twitter Media
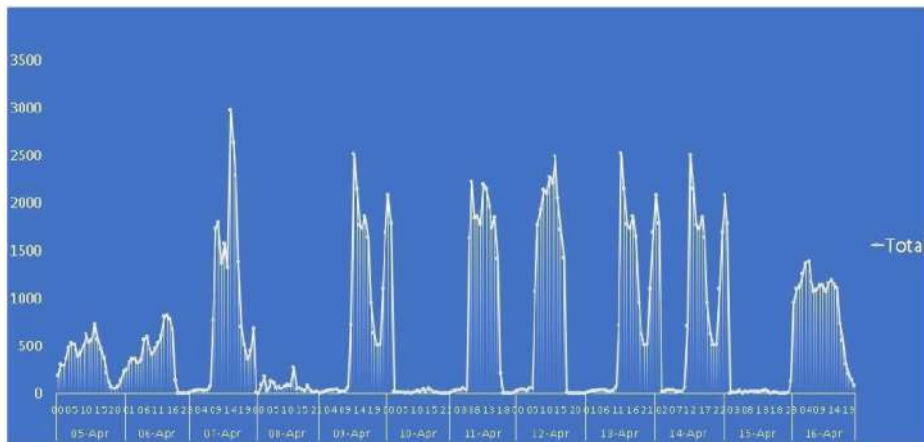
This research measures the sentiment of public opinion regarding the lockdown policy in Indonesia. The sentiment is understood based on the words in the tweet. To see the sentiment, the researchers classified the words in the tweet into three categories, namely: positive, negative, and non-categorized words. The research results show that 392,256 words were identified. Of these 58,140 (14.82%) were positive words, 68,657 (17.50%) were negative words, and 265,459 (67.67%) were non-categorized words. Based on the results of this research, it shows that public opinion about the lockdown policy tended not to crystallize in one sentiment category but into various sentiment categories.

Based on the grouping of words, it shows that public opinion on the lockdown policy is not yet one opinion. Most of the words in the tweets were categorized as non- categorized words. Public opinion sentiment of non-categorized words is essentially that of a group of people who are still in doubt about the lockdown policy. The difference in public opinion that leads to positive and negative categories is small and almost balanced. This shows that the implementation of the lockdown policy still causes different attitudes, and this is useful in put in evaluating public policies.

Public policy evaluations pay attention to positive and negative words as input to improve the implementation of lockdown policies in Indonesia. This can be seen from the tweets that received many replies and mentions from other Twitter users. The issues that many Twitter users talk about can either lead to positive or negative issues. Figure 3 shows the Top Five Tweets that Twitter users talked about in the period between April 9, 2020 and May 12, 2020.

Table 3

Top Tweet PSBB Policy in Indonesia

Account Name	Link	Date	Translation of Tweet	Number of Responses
@MuhadiklyAcho	https://twitter.com/M uhadiklyAcho/status/1 2480883823888895746	10:20 AM · Apr 9, 2020 · Twitter for iPhone	PSBB prohibits the gathering of more than 5 people. Music groups please be vigilant, the personnel who are not very good at singing are starting to be well informed	761
@podoradong	https://twitter.com/po doradong/status/1248 2716872264555008	10:28 PM · Apr 9, 2020 · Twitter for Android	Because the minister [Ministry of Home Affairs of the Republic of Indonesia] is from the brown corps [police], then all regional police act like governors [regional heads]. Defying the governor's rule and making his version of the PSBB according to his views. How do you expect to be successful? It's called DEFLATED!!!"	733
@ShutdownJAE	https://twitter.com/Sh utdownJAE/status/124 82105638022357761	6:26 PM · Apr 9, 2020 · Twitter for Android	Replying to @CNNIndonesia and @Daeng_Info PDIP Value Anies Is Just Slow to Implement PSBB in DKI Friday	615
@ReestyCayah	https://twitter.com/Re estyCayah/status/124 81810708911110402	4:46 PM · Apr 9, 2020 · Twitter Web App	why don't you disband the gang that clearly violates the PSBB #VirusCorona ini min @DivHumas_Polri @TMCPoldaMetro https://t.co/o0bMnluYuh	574
@ShutdownJAE	https://twitter.com/m arlina_idha/status/124 81895361793626977	5:02 PM · Apr 9, 2020 · Twitter for Android	DKI Pemprov Begins Distributing Social Assistance to Residents' Homes Ahead of PSBB We will come door to door [to houses] so as not to cause crowds that have the potential to cause the spread of Covid-19 to be even wider, "he said.	567

The top tweets provide important information for policy evaluation, to see what has been widely discussed regarding the lockdown policy in Indonesia. The top tweet about the lockdown policy in Indonesia is: "PSBB prohibits the gathering of more than 5 people. Music groups please be vigilant, the personnel who are not very good at singing are starting to be well informed." The top tweet received 761 responses from Twitter users and was included in the category of positive opinion because it reminded citizens not to go out on the street. In contrast, the second top tweet: "Because the minister [Ministry of Home Affairs of the Republic of Indonesia] is from the brown corps [police], then all regional police act like governors [regional heads]. Defying the governor's rule and making his version of the PSBB according to his views. How do you expect to be successful? It's called DEFLATED!!!" This opinion is negative because it does not agree that the police should make their regulations on enforcement of the PSBB and may conflict with governor regulations. This tweet was ranked second because it got the second highest response rate with 733 responses.

When a society is divided into various kinds of opinions, it shows that society experiences uncertainty. In an uncertain society, the role of leaders and community leaders is very important to reassure the community so as to prevent anxiety, anger, frustration, and, ultimately, conflict. Not all state leaders play an active role in solving problems related to the lockdown policy in Indonesia. The successful implementation of the lockdown policy is not only the responsibility of the country's leaders but also the responsibility of all Indonesian people. Famous people such as country dreamers and community leaders can play a role as top influencers whose job it is to campaign for the lockdown policy so that the public obeys it. Some of the top influencers who campaigned for the lockdown policy and received the highest responses from Twitter users can be seen in Figure 3.

Table 4

Top Influencer in Lockdown Policy on Indonesia Twitter Media
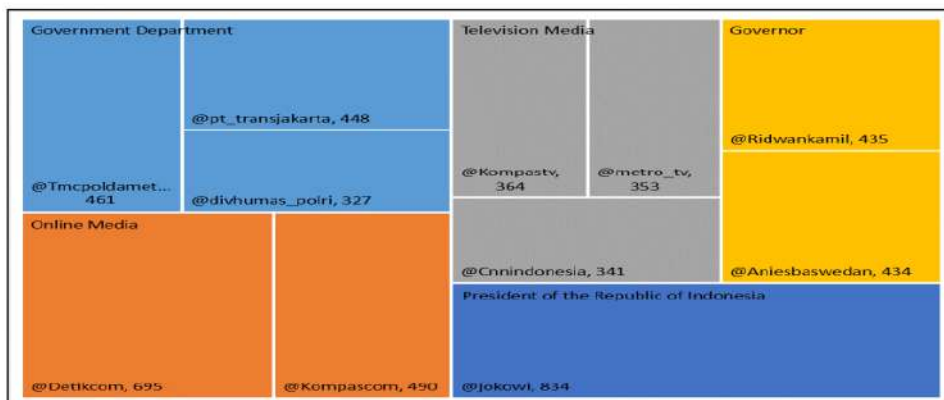
Joko Widodo, as president of the Republic of Indonesia, is a top influencer in campaigning for lockdown policies in Indonesian territory. The response of the Indonesian people to @jokowi is very good as can be seen from the number of responses. Online media such as @detikcom (695 responses) and @kompasmcom (490 responses) also play a big role in campaigning for lockdown policies in Indonesia. Indonesian people still believe in television media in obtaining lockdown policy information such as @ Compastv (364 responses), @metro_tv (353 responses), and @Cnnindonesia (341 responses). Government departments of the Republic of Indonesia such as @Tmcpoldametro (461 responses), @pt_transjakarta (448 responses), and @divhumas_polri (327 responses) received a fair number of responses. The governor has a very important role in campaigning for lockdown policies in his area, such as @Ridwankamil as the Governor of West Java (435 responses) and @Aniesbaswedan as the Governor of DKI Jakarta (434 responses).

Top influencer movements such as @jokowi and others in campaigning for lockdown policies can be identified through the network structure. Based on this structure, we see that @jokowi communicates with many Twitter users. Jokowi, as president of the Republic of Indonesia, occupies a central position in discussions on the lockdown policy in Indonesia. The central position can be seen from the @jokowi account symbol which is depicted in a larger size than other Twitter users. In addition, the @jokowi account is at the center of the communication network structure among Twitter users. Based on the communication network, @jokowi has a major role in providing direction to all elements of society, starting from the governor, the Indonesian police, mass/online media, community leaders, and community members in implementing the lockdown policy in Indonesia through Twitter.

Figure 2

Jokowi's Network on Implementing PSBB Policy on Indonesian Twitter Media
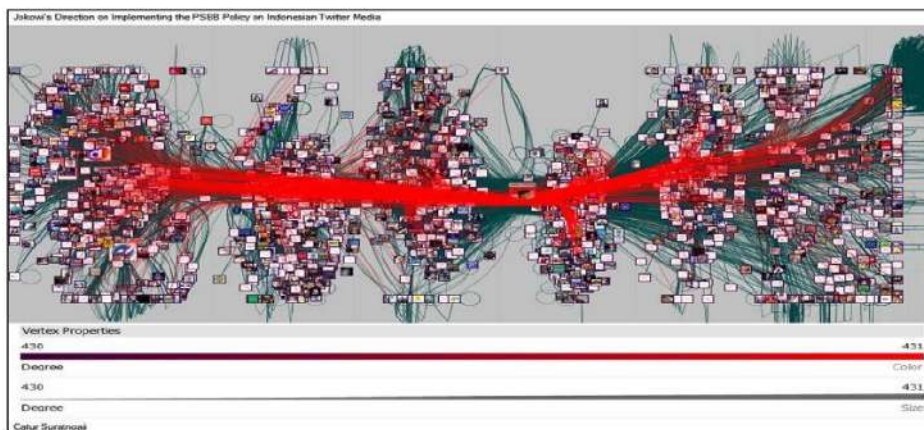
Conclusion

The lockdown policy, or in Indonesian terms "Pembatasan Sosial Berskala Besar (Large-Scale Social Restrictions)," is an issue of interest to the Indonesian people. Based on the sentiment analysis of the words of the tweets, most tweets in Indonesia are in the uncategorized word category. This category can also be said to reflect a neutral attitude, meaning that the Indonesian people do not show an attitude of supporting or rejecting the lockdown policy. Only 32.3% of Indonesians expressed positive or negative attitudes towards the lockdown policy.

In the uncertain situation of Indonesian society, the government cannot solve the problems related to the COVID-19 Pandemic. It can be seen that the credibility of Joko Widodo (Jokowi) as president of the Republic of Indonesia is higher than other top influencers in implementing lockdown policies in Indonesia. Online media such as @detik.com and @kompascom have an important role in conveying lockdown policies. In the network structure, Jokowi's roles are seen to be very diverse in communicating publicly with elements of society via Twitter.

Public opinion research methods based on big data have both opportunities and challenges. Public opinion research based on Twitter data provides research opportunities when survey research is difficult. However there are three challenges:
1) The selection of keywords in downloading data. Researchers realize that there are still data that are downloaded incorrectly because of the keywords chosen. 2) The process of categorizing public opinion sentiment variables becomes a challenge for researchers. Researchers must enter words that are incorporated into the software. Algorithmically, the software will have both positive and negative sentiments. Of course, there are words that have not been included, so that many words in tweets are in the words are not categorized. 3) Determining the sample is also a challenge because the amount of data on Twitter is very large. Even though researchers have limited the sample within a certain time period, the amount of data taken is still quite large. In order to overcome this, it requires the assistance of adequate research support facilities such as Twitter API support, servers, and Internet bandwidth.

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