



# Pandemic and Social Media: Textual Sentiment Analysis of the Indonesian Government Policy in Facing the Third Wave of Covid-19 Attack

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**Abstract.** This article examines the tendencies of information regarding the Indonesian government's response to the third wave of Covid-19 Omicron variant attacks. It begins by looking at big data of Twitter social media users who tweeted about this issue during the three weeks of the pandemic. This study employed textual sentiment analysis of Twitter big data and looked at the context of the tweets. The study shows that the negative sentiment of Twitter users was higher than the neutral and positive sentiments. It is further strengthened with the engagement of negative sentiment tweets higher than the other sentiments. The negative sentiment arose based on the fact that the government tended to surface some issues to divert the Covid-19 pandemic issue. This study then proves that even after the third wave of Covid-19 attacks, the public, at least Twitter social media users, still did not trust that the government had been able to cope with the pandemic. This study confirms previous studies that the Indonesian government did not manage the Covid-19 pandemic well.

**Keywords:** twitter, big data, textual sentiment analysis, covid-19, indonesia government

## 1 Introduction

Since the World Health Organization warned of the potential Coronavirus pandemic, the Indonesian Government has shown a non-serious response in anticipating the possibility of the virus entering Indonesia. This was evident in some research concerning the Government's policies, communication, and readiness to face the pandemic crisis [1][2][3].

Indonesia experienced the third wave of the Covid-19 pandemic in early 2022, commonly known as the Omicron variety. Following the second and third waves, numerous studies demonstrated that the administration was befuddled and failed to apply the most effective measures for dealing with Covid19. The third round of attacks has focused public attention on the Indonesian Government's professionalism and policy in dealing with Covid-19. The public's pro and contra comments regarding this policy are very diverse, especially on social media. This situation implies that anyone can freely express their viewpoint.

According to several assessments, Indonesia has the highest social media adoption rate. Table 1 summarizes social media adoption in Indonesia in 2021 using Hootsuite & We Are Social data.

**Table 1.** Social Media Adoption Rate

Platform	Potential audience marketers can reach using advertising
Facebook	140,000,000
Youtube	107,000,000
Instagram	85,000,000
Twitter	14,050,000

Source: Hootsuite & We are Social, 2021

Table 1 proves that Twitter is one of many social media where Indonesian people can express its opinion. Twitter, the world's most popular microblogging service, has shaped and transformed how people get information from people or organizations in which they are interested. On Twitter, users can broadcast status update messages called tweets to inform their followers about their thoughts, activities, and surroundings. Additionally, users can communicate by replying to or retweeting one another's tweets [4].

Twitter is one of the most extensively utilized social media platforms for commenting and expressing ideas about Covid-19 [5]. These comments can provide helpful information [6]. In addition, tweet data can be used as a source for big data. Big Data is a term that refers to massive volumes of complex, varied, and fast-moving data that require modern techniques and technologies to acquire, store, distribute, manage, and analyze information. Due to the exponential rise of digital technology, Big Data has become a hot topic for textual analysis [7]. While Twitter cannot be considered a comprehensive public dialogue, it can provide insight into popular trends and critical times, such as the Indonesian Government's response to the COVID-19 pandemic. With the ever-growing amount of data available from Twitter, mining users' expressed sentiment polarity in Twitter messages has become a hot research issue because of its numerous uses [8].

One of the pieces of information that can be generated through Twitter is sentiment analysis [4][9]. Sentiment analysis will classify the polarities of a set of texts to see how the opinion given is positive, negative, or neutral [10]. In addition, sentiment analysis is usually used to reveal public opinion on an issue, service satisfaction, and policies based on textual data. The tendency of public discussion messages on the issues raised is identified through this data.

In the context of Covid-19, studies on public opinion of government crisis management on social media are perhaps still uncommon. However, Covid-19 has been the focus of research in Indonesia, most recently by [11][12]. These two studies analyzed the news content used to report on the Covid-19 epidemic by analyzing the frequency with which social and economic issues appeared in internet news and the framing of Covid-19 news. Meanwhile, [13] looked at sentiment analysis on mental health during the Covid-19 pandemic [14] adopted a Stakeholder Engagement Index (SEI) to study public behavior on social media. However, these four studies did not focus on the public response to the Indonesian Government's crisis management of Covid-19 on Twitter social media. This is the chasm that this research attempted to fill.

Based on the description previously explained, this study aims to analyze the tendencies of information related to Indonesian government policies in dealing with the third wave of Covid-19 attacks based on big data on Twitter social media. In addition, this research focuses on textual sentiment analysis and public opinion on government policies dealing with the third wave of Covid-19 attacks.

## 2 Literature Review

### 2.1. Analysis of social media

Social media analysis is one of text mining's uses. Text mining, or text analytics, is a methodology and evaluation of textual data used to generate (generate) high-quality and valuable information and insights. According to Gartner Research, social media analytics is the monitoring, analysis, measurement, and digital interaction and linkages between people, topics, ideas, and other content that occur via social media. Natural language analysis, social network analysis (influencer identification, profiling, and rating), and more complex techniques such as text analysis, predictive modeling, and recommendation, as well as automatic recognition and classification of topics/subjects, people, or content, are all included in social media analytics.

Due to the volume and velocity of social media data, gathering and analyzing the millions of tweets/comments that surface every second is a significant task. Furthermore, social media users and their content are highly diversified, multilingual, and heterogeneous. Therefore, influential social media users' tweets or mentions are more critical than non-influential tweets [15].

Extracting critical information from a large quantity of text data is a challenging and timeconsuming procedure, made even more difficult by Twitter data. This is attributable to several factors, including (1) The diversity of data in terms of language, abbreviations, and emoticons. (2) Natural language's intricacy. (3) There are numerous methods to express the same concept, which results in ambiguity. (4) The data is multidimensional. (5) Sources of unstructured and diverse text data. (6) Unlike ordinary text documents, tweets are frequently not grammatically structured.

### 2.2. Big data

The collection of data from Social Networks has piqued the interest of Big Data researchers; the prevalence of such websites, where users generate a substantial amount of information not otherwise accessible, makes them one of the most significant potential sources for data, including textual data. The term "Big Data" is used when a dataset is so huge that it cannot be analyzed using traditional technologies in a reasonable amount of time. Big Data is a term that defines massive volumes of high velocity, complex, and variable data that demand advanced techniques and technologies to acquire, store, distribute, manage, and analyze the data [7].

Within the context of this research, big data derives from people's tweets: 140-character messages. By default, tweets are made available to the public. In addition, however, users have the option to subscribe to the tweets of other users (also known as becoming "followers"), transmit specific tweets to their followers (known as "retweeting"), or "like" (formerly known as "favorite") them.

To obtain the data from Twitter, researchers usually use text mining. Text mining is a computational technique to extract meaning and patterns from previously created text [16]. Traditionally, primary research has been undertaken through communication studies such as surveys and interviews with consumers to acquire data directly from them [17]. On the other hand, text mining enables similar research by utilizing publicly available data. Thus, the technique generates new knowledge by analyzing and classifying enormous amounts of unstructured data. Additionally, text mining seeks to discover relationships between words in sentences rather than simply finding words as a search engine does [18].

There are two ways to acquire data from Twitter: obtaining subsets of the released data using developer tools made directly available by Twitter or purchasing whole collections of tweets via a service provider. The apparent distinction is that the free solution restricts the amount of data that can be accessed compared to the paid option. In addition, researchers frequently utilize public tools, while businesses that opt to harness social data to support their operations tend to use commercial services [7].

### 2.3. Text and context

The traditional view that text is synonymous with writing or word has evolved into a larger conception. The text is closely linked with social practice, institutional processes, and political and economic activity. The text's meaning cannot be understood apart from the influence and performance of the culture in which it occurs [3].

Text may take the shape of writing, speech, illustration, music, or any other symbol [19]. The point is that these symbols are structured, and there are well-defined combinations of symbols. A media's messages, information, or news (text) will not be taken out of context. This indicates that message reconstruction will be affected by numerous factors, such as the sociopolitical climate. The text is always socially created to have a particular meaning and accomplish a particular purpose (forming an identity or creating an impression).

It is possible to learn the relevance of texts and contexts in various ways, just as it is possible to learn the emergence of diverse texts. This interpretation reveals that the term 'context' strongly emphasizes public activities. Context refers to the reality that meanings in the news text are formed through oral, written, and audiovisual actions and by accepting texts. Thus, there is a connection with the text principle. In addition, context comprises conditions and things outside the text that influence the use of languages, such as participants in the language, the situation in which the text is produced, the intended function of text representation, and others. Thus, the context surrounding the text (tweet, retweet, like, and reply) becomes essential in analyzing Twitter's big data sentiment.

## 3 Research Method

This research adopts textual sentiment analysis. It combines textual analysis and sentiment analysis on existing text. Sentiment analysis refers to the broad field of natural language processing, computational linguistics, and text mining which has the aim of analyzing the opinions, sentiments, evaluations, attitudes, judgments, and emotions of a person, whether the speaker or writer is concerned with a topic, product, service, organization, individual, or specific activities. The task of sentiment analysis is to classify texts into sentences or documents and then determine whether the opinions expressed in the sentences or documents are positive, negative, or neutral [20]. Textual analysis was further adopted to understand the context of the data sentiment. It is principally the examination of the text's context. This perspective suggests that understanding the development of a text is intrinsically related to its environment of origin. Thus, the analysis of social media messages should consider broader cultural contexts [21].

The period was three weeks for data collection, from 7 to 28 February 2022. The emergence and the peak of the third wave Covid-19 attack, known as Omicron, became the basis for the selected period. This research set specific predefined keywords "Covid-19", "Covid-19 cases in Indonesia", "Omicron," and "Omicron in Indonesia" and limited the search to the country

"Indonesia". The characters, words, and sentences identified at this stage were the basic units passed on to further processing stages.

The social media analytics platform then isolated and analyzed each hashtag and theme for sentiment during the data analysis. This polarity assignment was necessary because, ultimately, even though the platform assigns different scores to different aspects, the aggregate score is calculated to determine the audience's sentiment towards the issue. Another issue this study looked at was the engagement of the tweet. Engagement is the number of users who have interacted with social media content. Engagement is simply content earned - likes, shares, comments, clicks, retweets - and whether one's audience reacts to it.

Retweeted messages illustrate the importance of the message [22]. The account with the most retweeted messages shows the importance of the account to the retweeter. Retweet also shows people's approval of the content of the tweet they retweet. The case is different from mentioning it in a tweet. People who write mentions of a tweet may agree or disagree with the content of the tweet. Therefore, the existence of a mentioned account also does not necessarily indicate the importance of the account [23].

The next stage was communicating the analytical results visually and contextually, presenting them. Finally, the visualization presented the results obtained more straightforwardly and faster. For example, viewing charts and identifying trends can be done quickly. Meanwhile, contextualization gave a better understanding of why particular sentiments appeared the way it is.

## 4 Findings

The epidemic caused by COVID-19 has spread to every region of the earth. This situation led crisis inside some governments regarding how those governments should respond to the consequences of the virus. In Malaysia, the government's failure to cope with the pandemic resulted in the prime minister's resignation [4]. How has the Indonesian government dealt with the Covid-19 pandemic? How the Indonesian government has coped with the Covid-19 pandemic for the past two years has always been a debate. The government's incompetence when the first time the virus entered the country in early 2020 was so apparent. The confusion about the right policy to manage the spread of the virus was evident in the early stage of the pandemic in Indonesia. In one instance, the government dismissed a Harvard University professor's warning that Indonesia may have many COVID-19-positive patients [3]. The Indonesian government's unclear policy continued on following year when big online media *Kompas.com* reported on the slowness and vague policies of the government in response to the outbreak [2].

Consequently, the pandemic infected 2,5 million people, with 94 thousand of them having died [25]. Thus, when the third wave of the Covid-19 pandemic surfaced in early 2022, public or social media users in Indonesia seemed to be skeptical of the government. The finding of this study revealed the evidence. Table 2 shows the sentiment analysis result of Twitter users concerning the third wave of Covid-19 in Indonesia for three weeks in early February. Based on the classification results, some information on government policies regarding handling the COVID-19 outbreak in Indonesia can be analyzed.

**Table 2.** Sentiment analysis per week

Sentiment	First week	Second Week	Third Week	Total	
Positive	2.843	4.138	5.318	12.299	11.5 %
Negative	18.442	21.607	9.568	49.617	46.44 %
Neutral	17.136	17.817	9.965	44.918	42.06 %
Total	38.421	43.562	24.851	106.834	100 %

Source: primary data, 2022

Table 2 shows that the total tweets during the three weeks reached 106.834. This indicated that social media users were active and paid attention to the third Covid-19 attack. Twitter users' sentiments tended to be relatively negative, with 49.617 tweets (46.44%), followed by positive sentiment with 44.918 (42.06%). Meanwhile, the positive sentiment was relatively small, with 12.299 tweets (11.5%).

Of the three weeks of negative sentiment data distribution, only the third week was where negative sentiment data was slightly less than neutral sentiment data. Tweets with negative sentiment blamed the Government, which until the third attack was still not focused on solving the Covid problem. Some of the top tweets under this category looked at the emergence of several issues considered government attempts to cover up its inability to overcome the pandemic. Table 3 describes the tweets that conveyed negative sentiment about the Indonesian government's incompetence in handling the COVID-19 crisis.

**Table 3.** Tweets and engagement of negative sentiment from top accounts

Tweets	Engagement	
	Retweet	Like
After Omicron fails to orbit, the Minister of Manpower's regulation on old-age insurance is issued. When the Minister of Manpower's regulation on old-age security fails, the issue of social security will be raised. If it still fails, other issues will also be raised. This situation is to cover up issues from within the palace (Tweet: @LurahIstana, 24/02/2022).	683	2,200
People are suffering. Omicron has also not been resolved, added with the regulation of the Minister of Manpower Number 2 of 2022, which cause trouble for workers. overnment should have prioritized solving the problems above instead of sticking with the new nation's capital project. Hopefully, it will be a concern (Tweet: @hnurwahid, 16/02/2022).	141	464

Source: primary data, 2022

The @LurahIstana account was anonymous. However, its follower reached up to 21,400 followers. The above tweet received 2,200 likes and 683 retweets. This showed that the tweet received relatively high engagement. Twitter users who liked and retweeted the tweet from this account also agreed with the content of the tweet that looked at the government tended to bring about other issues to divert the Omicron issue.

Surprisingly, during the analysis of this finding, the @LurahIstana account was suspended by Twitter. This condition was strongly related to the opposition toward the government that this

account aside. Following the Indonesian New Order era, where the Indonesian government suppressed the press, the Jokowi administration monitored social media under the Constitution of electronic information and transaction through the Ministry of Communication and Information. The government could assess any information on social media, including tweets, to have proliferated hate speech toward the government, terrorism, harassment, and violence. The Constitution of electronic information and transaction had become a tool to suppress the freedom of speech. As the Director of Informatics Application Governance, the Ministry of communication and information states, "We can trace quickly through the use of data from the perpetrators that we get, such as telephone numbers, account numbers, money transactions, addresses, and other data obtained in small increments which will later collect vital information. So there is always a way to track someone through a digital footprint," he said (Wikanto, 2021). The new account as the substitution for the suspended account, however, had appeared under the name of @Lurah\_SC

The second account showed a tweet from the @hnrwahid account. Hidayat Nur Wahid is the vice chairman of the People's Consultative Assembly and is a politician from Prosperous Justice Party (Partai Keadilan Sejahtera). With more than 1.5 million followers, it is unsurprising that the tweet he submitted will get a response from many of his followers. His tweet on Omicron, which criticized the government, received 464 likes and 141 retweets. This indicated the engagement of Twitter users concerning the tweet from the @hnrwahid account.

Further textual analysis shows the context of the tweets where the existence of a plan for the new National Capital has diverted government focus in managing the Omicron (Covid-19 variant) from spreading. In addition, the Jokowi administration's insistence on moving the country's capital at an enormous cost has also attracted the attention of experts due to the inappropriate timing and large allocation of funds. News Media like *CNBC Indonesia* (2021) highlighted this in their news by saying, "Estimated to reach IDR 466 trillion, the cash for the new country's capital will have a greater positive impact if used to combat the Covid-19 pandemic and build Human Resources. The Covid-19 pandemic has caused the economy not to run the same as before. Because efforts to deal with the pandemic have made restrictions on human activities and digitalization develop rapidly".

Another issue that arose during the Omicron crisis was the release of Minister of Manpower Regulation No. 2 of 2022. The regulation stated that for Social Security Benefits for Seniors at the age of 56, individuals who have attained retirement age are paid a pension [9]. This means that workers cannot withdraw their funds before age 56. The situation led to a debate between workers, government, legislative members, and academics. To some Twitter users, this issue has distracted government attention from managing the Omicron crisis. This was improper given the widespread pandemic.

Thus, Twitter users' negative sentiment was strongly related to social context. For example, the discussion among Twitter users became more robust when they shared a similar understanding that the Indonesian government did not handle the Covid-19 pandemic well. The construction of this understanding can come from engagement with social media users, news media, or other means of communication.

Table 2 shows that neutral sentiment came next after the negative sentiment, with 44,918 tweets (42.06%). Twitter users that fell under this category tweeted about the disease's symptoms that were lighter than Delta Variant of Covid-19 virus and the importance of maintaining health protocols. Also, when viewed more specifically, neutral sentiments were primarily generated from tweets of government agencies and online media accounts that provide information. Generally, the tweets from these accounts were in the form of the news lead on the website. So it tends not to be included in the positive or negative class.

**Table 4.** Tweets and engagement of neutral sentiment from top accounts

Tweets	Engagement	
	Retweet	Like
"Wearing a Mask is Important" Obeying the procedure by always wearing a mask helps the government control the Omicron variant of Covid-19. And continue to support the Accelerated Vaccination Program by immediately completing your vaccine dose #PatuhLaksanakanProkes Supports Accelerating Vaccination (Tweet:@PIDM_Bojonegoro, 19/02/2022)	45	48
The chairman of the Covid-19 Task Force, the Executive Board of the Indonesian Doctors Association, Zubairi Djoerban, asked the public to use N95 and KN95 masks to avoid transmission of Covid-19, especially the Omicron variant (Tweet: @kompascom, 17/02/2022)	6	15
The Omicron variant has entered Indonesia, and now there are many new cases. Let us avoid Omicron this way! (Tweet: @KampusLangit, 09/02/2022)	1	6

Source: primary data, 2022

Tweets with neutral sentiment usually appealed to implementing health protocols along with the increasing number of omicron cases in Indonesia. This was evident in some tweets of the government agencies. However, tweets that attracted more engagement were those from the regional Police Twitter account instead of the Health Agency. For example, a tweet from the @PIDM\_Bojonegoro account was the tweet that received the most engagement, with 45 retweets and 48 likes. This may represent that maintaining health protocols, including wearing masks in outdoor and indoor areas, was still necessary. Although the tweet on neutral sentiment was high, the engagement of neutral sentiment tweets was not as high as in negative sentiment tweets.

Meanwhile, despite the @kompascom account being a reputable online news media with more than 8,5 million followers, its tweet only received 15 likes and got retweeted by six followers. Thus, it implied that Twitter users' engagement or involvement in neutral sentiment was less active than in negative sentiment. One argument for this was due to the routine tweets of news headlines from the news media Twitter account, which then attracted lesser Twitter users to engage in the tweets. Another argument was the tweet's content, considered normal in the pandemic era.

Table 2 also shows the last category, the positive sentiment. With the total tweets reaching up to 12.299 (11.5 %), this sentiment indicates the Twitter users' positive perspective despite the increasing number of people infected with the Omicron variant of the Covid-19 pandemic.

**Table 5.** Tweets and engagement of positive sentiment from top accounts

Tweets	Engagement	
	Retweet	Like
Indonesian children are great. Salute to their fighting spirit. Unfortunately, let alone Omicron, stream cron also passed (Tweet: @NenkMonica, 15/02/2022).	515	2,200
Regarding the Omicron variant, Ridwan Kamil asked West Java residents always to be vigilant. Kang Emil said that although the fatality rate was not as	111	1300



dangerous as Delta, the Omicron variant was still dangerous, so people must always apply health protocols. With Champion (Tweet: @illuviatalks, 14/02/2022).

Omicron had infected 100 people in the office despite the fact they had been working from home for a long time. Thank God I am still healthy even though I have been working since the beginning of Covid. Take vitamins, get enough rest and manage emotions. Avoid negative things, joke a lot or relax so your immune system is good (Tweet: @Ritafauzh, 15/02/2022).

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295

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Source: primary data, 2022

Despite thousands of tweets identified as positive sentiment, this study hardly found tweets that supported how the government managed the pandemic. Instead, tweets included in the positive sentiment tended to contain Twitter users' personal experiences that felt grateful for still being healthy in the increasing condition of Omicron third wave attack. This case, for instance, was evidence if looking at the tweet from the @NenkMonica account. Also, a tweet from @illuviatalks accounts quoting the West Java Governor's statement invited people to be wary of Omicron. Even though it was not as dangerous as the Delta variant, an invitation to be more careful about implementing health protocols must always be sounded. At the same time, the second tweet account showed optimism by including a picture of elementary school children attempting to cross the small river. Interestingly, this second tweet received 525 retweets and more than 2,100 likes. At the same time, the third tweet was more like a self-reminder to always take care of oneself and be aware of the existing virus. This suggested people's optimism in facing Omicron.

Looking at the sentiment analysis presented in Table 2 and the textual analysis shown through top tweet samples that fall in each sentiment category presented in Tables 3 to 5 above, this study showed the description of Twitter social media users in Indonesia regarding the Omicron of Covid-19 variant attack in Indonesia. Concerning the government policy in managing Omicron variant attacks, Twitter users seemed to reflect on how the Indonesian government handled the covid pandemic in the first and second waves that occurred in 2020 and 2021. During these periods, government policies tended to shift undirected and apply unclear policies [2][3][27][25][28]. The government's indecisiveness, for example, was evident regarding entry permits for travelers from India, who, at that time, the Delta variant was ferocious. On other occasions, the government declared a temporary restriction on international travelers from countries or regions with community transmission of Omicron cases. Prohibition of entry for those originating or having travel history from countries or regions with local cases of Omicron [29]. This shows the contradictory policies of the Indonesian government in dealing with the Covid-19 case. Consequently, this impacted the number of Indonesian citizens infected with the Delta variant virus, leading to Indonesia's highest death peak.

Despite policies the government had taken to overcome the crisis, the Twitter users tended to portray the diverting of Omicron issue by raising the issue of government regulations regarding old-age insurance, and the new nation's capital project once again shows the government's unpreparedness in dealing with the third wave of Covid-19 attacks. Therefore, it was unsurprising that Twitter users tended to have negative sentiments toward government policies dealing with Omicron. Meanwhile, the neutral sentiment was also relatively high, but the engagement of top tweets was not as high as negative sentiment tweets.

Implicitly, this research also indicated that the authorized government agencies, the Ministry of Health and the Covid-19 Taskforce, still did not optimize the use of social media as part of its Covid19 crisis communication, which was vital. The Covid-19 pandemic has changed

people's activities, which were usually carried out in physical spaces to digital spaces, and increased their vulnerability to being exposed to hoaxes on social media. Thus, valid information from authorized government agencies was necessary. However, the sentiment analysis of this research hardly found tweets from government agencies. The identified tweet came from the regional police office tweet account instead of from the Ministry of Health or the Covid-19 Taskforce. The study from [30] strengthened the finding of this study by showing how government officials used their private accounts to spread the correct information about Covid-19 and implicitly indicated the lack of government social media use.

## 5 Conclusion

As a global issue of concern, governments of various countries are struggling to overcome the Covid-19 pandemic. Unfortunately, the Indonesian government showed indecision and inability to manage Covid-19 at the time of the emergence of this pandemic and when the Delta variant attacked. Thus, when the third wave of the pandemic attacked through its Omicron variant, the way the government managed Covid-19 had become public discussion, including among Twitter Social Media users. Twitter users focused their attention on the professionalism and strategy of the Indonesian government in dealing with Covid-19. The public's comments for and against this policy were incredibly diverse.

The use of textual sentiment analysis in this study managed to textually classify tweets and their engagement of Twitter social media users in Indonesia. In addition, it further gave the context of why particular tweets' sentiments received more engagement than others. Textual sentiment analysis went beyond count-based metrics and gave insight into text by building the context of the text.

This study shows that Twitter social media users in Indonesia were quite intense in commenting on how the Indonesian government managed the third Covid-19 attack. The dominance and high engagement of negative sentiment data on Twitter users on how the government deals with the Omicron variant showed that users still see the Indonesian government as not yet seriously handling the third wave of the Covid-19 pandemic.

The government should have played its role in correctly communicating with society through various ways, including social media. Social media's benefits for the government include encouraging government efficiency, restoring public trust that has fallen on government policy issues, responding to technological progress challenges, and being used to communicate during crises and natural disasters.

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