



Twitter as a Communication Tool for Flood Disaster Mitigation in Jakarta

Muhammad Hazim Khahir¹ (✉), Achmad Nurmandi^{1,2}, and Misran¹

¹ Department of Government Affairs and Administration, Universitas Muhammadiyah, Yogyakarta, Indonesia

{muhammad.hazim.psc22,misran.psc20}@mail.umy.ac.id,
nurmandiahmad@umy.ac.id

² Department of Government Affairs and Administration, Jusuf Kalla School of Government, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

Abstract. This study aims to analyze disaster mitigation communications and communication patterns between the people of Jakarta and the government in handling floods via Twitter. This type of research will use a descriptive qualitative approach. This paper will use Nvivo12. The primary data source for this research is the activity records of Twitter users using the hashtag #tinggimukaair #peringatandini-jkt. The findings in this article are digital communication via Twitter with hashtags including #tinggimukaair #peringatandini-jkt. The hashtag #tinggimukaair is used to find information on the height of the flood level, and the location of the flood. Meanwhile, the #peringatandini-jkt hashtag is used by the DKI Jakarta Provincial Government to share information related to disaster mitigation, such as rainfall, and center number assistance. With digital communications interconnected with point-to-multipoint (PMP) channels, one of the features frequently used on Twitter is the use of hashtags used on government and public Twitter accounts. The use of hashtags on Twitter is of course to build awareness of the disasters that have occurred in Jakarta, especially in dealing with floods that occur every year.

Keywords: Twitter · Hashtag · Digital Native · Mitigation

1 Introduction

Providing emergency information to population living in the vulnerable areas, therefore, has become a measure of disaster resilience and a policy priority (Feldman et al. 2016). Given the increasing presence of social media in everyday life, it can be a major platform for sharing emergency information such as warnings, disaster relief efforts, crisis mapping for escape routes, search and rescue, and connecting community members following a disaster (Houston et al. 2015). Twitter is one of the prime social media platforms, which has been used not only during emergency situations, but it also changed the way people create, disseminate, and share emergency information (Li et al. 2018). The real-time characteristic of Twitter makes it a suitable crowdsourcing platform for dissemination and collection of information including texts and pictures during disasters and crisis events (Yuan and Liu 2018). As twitter generates a large of amount of

data, the researchers have attracted to analyse this data. The data can reveal different aspects of user behaviour which is useful for companies to provide online services, create awareness among people and use people network to make decisions for government institutions. As twitter is one of the most prominent social networking site used by people to express their views in the form of a tweet (Sujay et al. 2018). In the digital era, many actors can use social media. Apart from individuals, the government uses social media to interact with the community virtually to increase participation and accountability. New media such as the internet, applications, and social media create a new interaction style between the government and society (Nurmandi et al. 2020).

Social media is defined as websites and applications that enable users to create and share content or to participate in social networking. These sites provide a platform for discussion on issues that has been unnoticed in today's world. It is one of the most modern and favourite form of social media including many features and social characteristics in it. It has many advantages on same channel like as communicating, texting, images sharing, audio and video sharing, fast publishing, linking with all over world, direct connecting. It is also a cheapest fast access to the world so it is very essential for all age group of peoples. Information and communications technology (ICT) refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audio visual processing and transmission systems, and network-based control and monitoring functions (Kumari 2020).

Information Communication Technology (ICT) defines and revolutionizes the way we live and work. By providing impact and prospects in the digital world that offers ease of communication offered accelerates connectivity. The use of technology today is important by not having boundaries globally with the current internet diversity, and this is certainly a means of communication that brings a new paradigm in interacting between people. The internet brings the transformation of conventional communication users into a digital platform, one of which is Twitter being a communication tool that makes it easier for people to find information with the use of hashtag signs on Twitter.

Twitter is not only a platform for human interaction in the digital world, but with the presence of Twitter is able to change the pattern of political communication, in Indonesia political communication is related to communication by the government and society, Information Communication Technology (ICT) defines and revolutionizes the way we live and work. By providing impact and prospects in the digital world that offers ease of communication offered accelerates connectivity.

The use of technology today is important by not having boundaries globally with the current internet diversity, and this is certainly a means of communication that brings a new paradigm in interacting between people. The internet brings the transformation of conventional communication users into a digital platform, one of which is Twitter being a communication tool that makes it easier for people to find information with the use of hashtag signs on Twitter. Twitter is not only a platform for human interaction in the digital world, but with the presence of twitter able to change the pattern of political communication (Setiawan 2022).

In Indonesia, social media as a strategy for public communication related to information on the Flood Disaster Mitigation. Flooding is one of the natural disasters that often occurs every year in Indonesia, especially in Jakarta. The floods that hit the capital

city of Jakarta almost every year are a challenge for the government. Climate change is projected as the cause of rising water and river levels resulting in increased rainfall in some areas. Flooding and inundation are common in the capital and buffer areas. The existence of social media is easy in responding to disasters, especially floods throughout Jakarta and its surroundings.

Through the Regional Disaster Management Agency (BPBD) DKI Jakarta utilizes social media as a communication tool based on applications to convey disaster preparedness information, such as floods in the rainy season. By using @BPBDJakarta Twitter account, information related to floods and weather uses this application to the fullest. Activity on Twitter accounts mitigates information through status or tweets, for example for @BPBDJakarta accounts that use #tinggimukaair #peringatandinijkt hashtags. The social media had to listen to various aspect messages to spread information about flood mitigation in Jakarta, government communication through social media and the public on Twitter. This two-way communication model uses the retweets and comments feature available (Trajkova et al. 2020).

The government must provide correct information regarding disaster management mitigation related to floods that occur every year. by activating information technology through Twitter media as a means of public communication and disaster information mitigation. From the explanation above, this study aims to find out the comparison of information about floods, with digital citizenship with social media activities, the community and the government can exchange information through Twitter which can effectively provide information and socialization through interactions that are quite helpful in handling flood mitigation in Jakarta.

2 Literature Review

2.1 Technology for Government

The literature on the use of technology for disaster management shows a growing interest in the field. However, it also shows that the main focus of contemporary literature is on the technology-specific opportunities and challenges of enhancing disaster management by investigating technology-specific, phase-specific and task-specific aspects of the use of technology for disaster management (AlHinai 2020). With current developments, the use of technology is increasingly needed, especially in handling disasters that can provide information using digital media as a tool that can provide information quickly. The concept of E-government can be interpreted as using data and telecommunications technology for efficient and effective governance and providing transparent and satisfying services to the public (Twizeyimana and Andersson 2019). ICT or information technology and information have become part of the government's work to improve performance, including leadership effectiveness, public participation, and information disclosure (Harguem 2021). Information Communication Technology (ICT) refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audio visual processing and transmission systems, and network-based control and monitoring functions.

ICT refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums (Kumari 2020). ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. Increasingly these activities also involve collaboration and communication. Practicality enjoys using ICTs which fulfil a need and help them complete tasks in their everyday lives. They see the ICTs they use as being function specific and highly tied to a single aspect of their lives, be it for use in their work, family, leisure, or community. These technologies are viewed as for their own personal use and they place a high value on those with proven functionality. They have no interest in exploring how to use a single ICT in every facet of their lives. Practicality place ICTs in function-specific rooms, often placing computers in home offices and televisions in entertainment rooms. Practicality see ICTs as tools (Birkland 2019).

2.2 Digital Native and Disaster Mitigation

The use of digital technologies has become a central cultural technique that increasingly determines educational opportunities, the possibility of upward social mobility, participation in social life and good job prospects. Thus, as a technological and social phenomenon, digitalization affects virtually all areas of life. (Janschitz and Penker 2022). The information society has found ease abounding since entering the internet age. People are also easier to connect to interact with each other. They communicate, behave, work, and think as digital natives (Pujasari Supratman 2018). Digital communication is the main way to communicate with each other connected through social media. Social media is a tool for government communicators to communicate with the community. Using social media, the government can connect with the community at any time, both of which have been integrated as an adaptation and innovation for government work progress (Mergel 2016).

The existence of social media is now an alternative medium for institutions or companies to explore to help them fulfil the vision, mission and goals of their own organizations, and information about innovative values in the e-government system as a whole (Fajriyah, Antoni, and Akbar 2020). Collaboration between government and social media in e-government practices in social scientist studies can positively impact public responsibility and trust in the government (Song and Lee 2016).

However, with virtual or e-government communication channels, social media is not the primary communication tool to reach public participation because virtual communication still has shortcomings. For example, Santander Smart city in Spain conducts direct meetings to continue programs communicated through social media (Díaz-Díaz and Pérez-González 2016). The important role of the government in providing responsibility in overcoming the dialectic between the government and society. The critical role of social media for the government is as a medium for disaster communication and to provide disaster preparedness messages as public information (Eko et al. 2022). Information about disaster mitigation by the government can officially become valid data for the community in dealing with disasters (Palen and Hughes 2018).

In an emergency, social media is not only a coordination and communication tool used by the government but has become part of a tool towards humanity as a preparedness measure for disaster. Looking at Takashi’s explanation by categorizing the function of social media as a means of disaster communication, as shown in Table 1 below.

Table 1. Category and description of social media use Takhsi 2015

No	Category social media usage	Descriptions
1	Situational report	Information regarding disaster emergencies, mitigation, handling or preparedness used by individuals and organizations
2	Government critics	Information from official government social media to provide public information during a disaster emergency
3	Relief effort coordination	Use of social media for philanthropic activities or volunteering in cases of disaster emergencies

3 Research Methodology

This study used a qualitative, defines descriptive qualitative (QD) as a research method that moves on a simple qualitative approach with an inductive flow. This inductive flow means qualitative descriptive research (QD) begins with an explanatory process or event which can finally be drawn as a generalization which is a conclusion from the process or event. This study uses qualitative description by analyzing political communication activities and Ridwan’s branding on Twitter social media (Nurmalasari and Erdiantoro 2020). Data collect through (@BPBDJakarta) Twitter account. Furthermore, the data were coded using the NVivo 12 plus research application to determine each coding Twitter account’s metadata classification. The NVivo software is one of the qualitative data analysis tools used by many qualitative researchers around the world (Sotiriadou, Brouwers, and Le 2014). Researchers would describe the NVivo process results to determine a comparison or difference regarding the two accounts’ mitigation information.



The data was taken using the NVivo 12 plus Capture feature in Chrome web browsing to view content in the form of content from social media. The NVivo 12 plus visualization in this study uses the coding feature manually to find data, analysis is used to study data processing and answer analysis. With the word cloud, we are able to analyze and find words that often arise from findings that are commonly used and discussed. This study also looks at cluster distribution to visualize and collect dominant data/words that have similarities and differences.

4 Analysis, Finding and Discussion

4.1 Information Topic Intensity on Official Twitter Government

Figure 1 shows the number of word frequencies used by Twitter in the DKI Jakarta government through the @BPBDJakarta Twitter account. In this account, the word “Rain” dominates information sharing during the floods in Jakarta. The word “peringatandini-Jkt” is often used to refer to the frequency of information about flood data widely on the account @BPBDJakarta.



Fig. 1. Word Frequency @BPBDJakarta

Netizens’ tweets that have been collected are often uploaded by following #peringatandinijkt. Analysis related to #peringatandinijkt aims to find out from the words that most often appear in a tweet or post followed by a #peringatandinijkt. There are some words that are quite dominant, the dominant word is mostly in line with the hashtag they attached, namely #peringatandinijkt. There is a dominant word appearing in the upload that attaches #peringatandinijkt, the dominant words are Rain, Wind, Potential, and Flood.

4.2 Domination Information Message on @BPBDJakarta

The results of the search using NVivo 12 plus, are based on a number of frequently appearing accounts that use hashtags to communicate such as the #perigantandinijkt hashtag which is continuously updated on the Twitter timeline. In Fig. 2, there are five accounts that are used the most. If you look at the pie chart, the BPBDJKT account uses

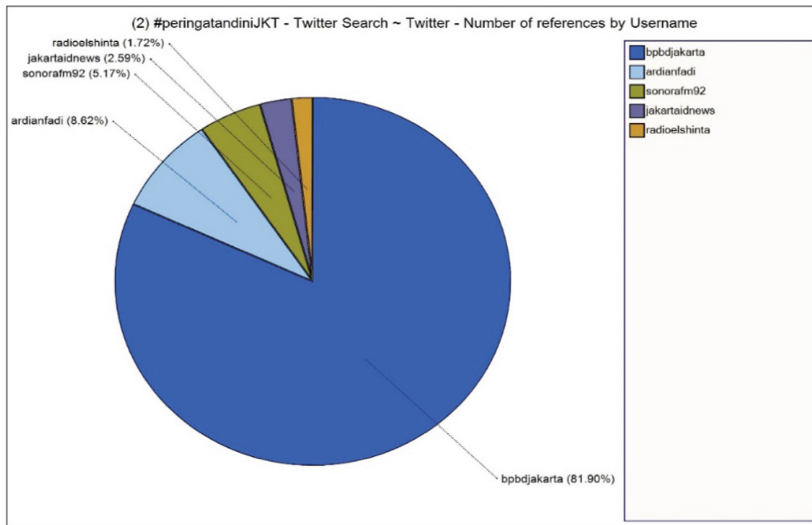


Fig. 2. The Number of Reference by username

this hashtag more often, other accounts quite often and the other three rarely use this hashtag.

The use of hashtags is generally often used by Twitter users for conversations related to issues or news that are demographically present in Jakarta. This is to create a conversation network about the problem of flooding, especially areas that are often the worst affected among others. Civil society will of course be facilitated by using hashtags to make complaints digitally through the features on Twitter. Apart from that, of course, for flood prevention mitigation which can be immediately updated related to flood information quickly. Information related to flooding in Jakarta has a distribution of mentions that are often used in providing information. Figure 3 shows the account @infobmkg often mentions the hashtag #peringatandiniJKT. The other 3 accounts that use mention the most are @BPBDJakarta 2 others quite often but not so intently.

The distribution of mentions in Fig. 3 is a utilization of the existing features on Twitter, with the convenience of these features, of course, it will be very easy when providing information that can connect one to another, the convenience of these features can be immediate and fast when there is new information. This is possible because of the reply feature on Twitter which can be immediately received by the account concerned which is mentioned in the form of a notification, new interactive media allows for direct feedback and there is a transformation of the boundaries between audiences and information producers. This means that in new media the audience is not merely placed as an object which is the target of the message. The audience and changes in media technology and the meaning of the medium (news distribution) have renewed the role of the audience to be more interactive with the message (Nasrullah 2016) (Fig. 4).

Based on Fig. 3, the number of tweets is more than re-tweets, this shows that the intensity of news/tweets made on Twitter is very active and varied. Twitter has its own traits and characteristics, which may be simpler than other social media tools. Many

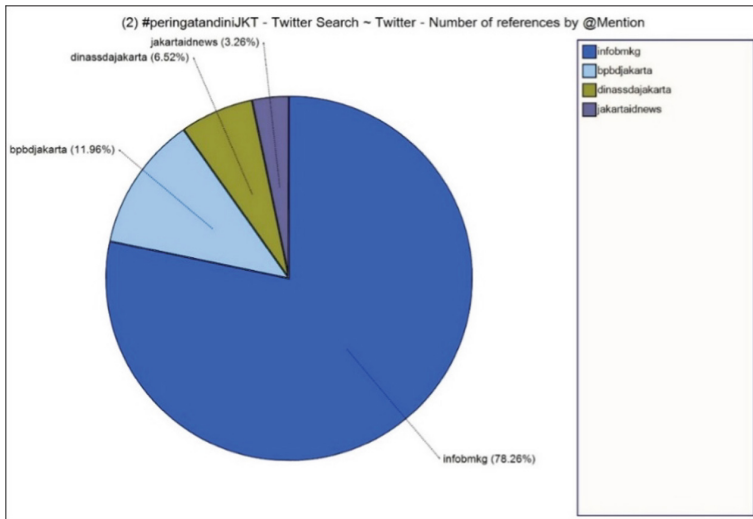


Fig. 3. The number of references by @mention

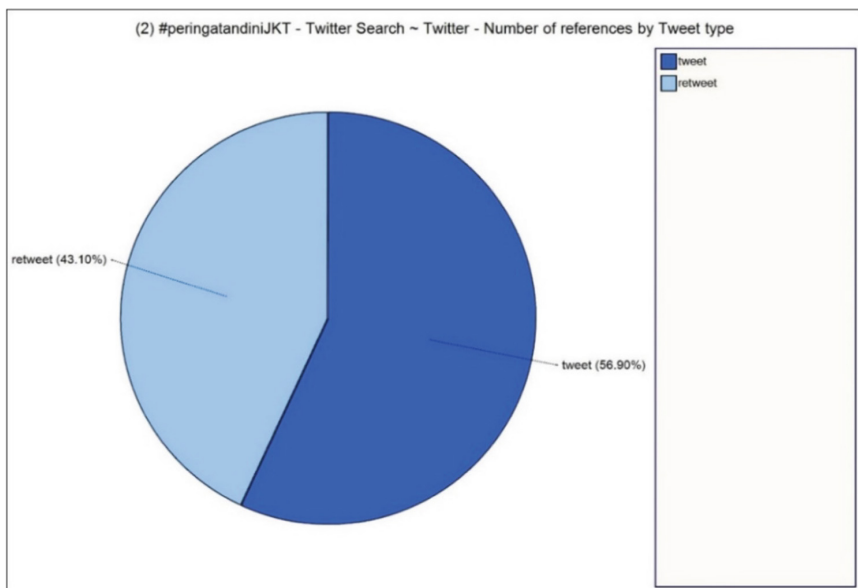


Fig. 4. The Number of Reference by Tweet type

terms exist only on this bird symbol site. First, Twitter operates a digital information service that enables users to send and track micro-messages known as (tweets) of no more than 140 characters. The tweet facility is designed for use on mobile devices and PCs. Twitter is used to post any status, repost other users' statuses (retweet), respond to other users' posts (replays), and share links. Users may also have links to their blog

posts sent via Twitter, either post-by-post or automatically. This feature certainly helps provide information directly, as a noun, is a tweet from another account that is forwarded to followers with the aim of spreading it to a wider network. As an adjective, the action of forwarding a tweet from another account for followers to see. (Quote retweets are retweets that are written in quote form so they look like replies) (Rezeki 2020).

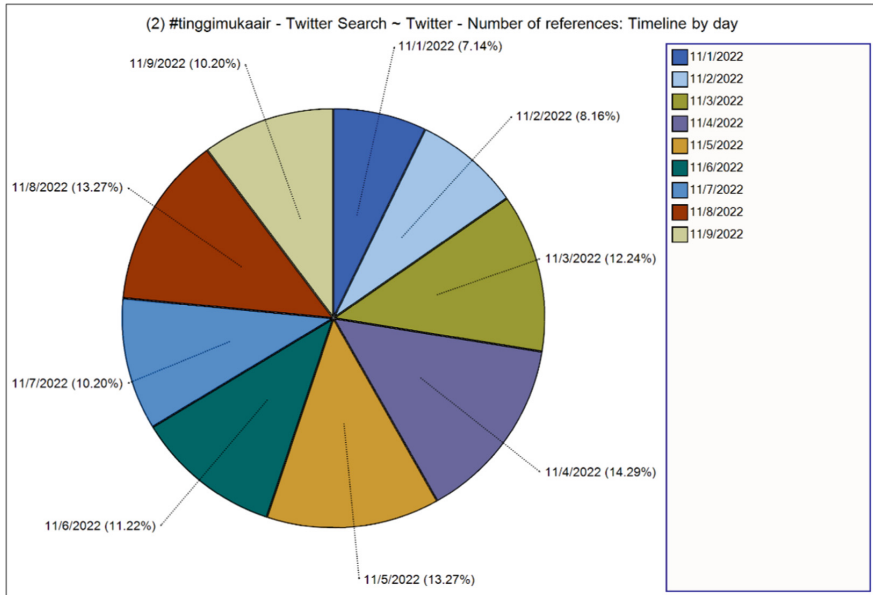


Fig. 5. Timeline by Day

In Fig. 5, by presenting the tweet feature, users are given the convenience to share a tweet both individually and tweets from other accounts to all of their followers by finding one or several tweets that they like. Even just wanted to share the tweet with followers in the @BPBDJakarta account on the timeline. This timeline within Twitter works to display a stream of tweets from accounts that are followed on Twitter viewing constant supportive content from various recommendations as well as Retweeting or liking Tweets made within the homepage.

To update the information held by any user or account owner, people can follow (subscribe to) that person’s Twitter account. When a Twitter user has followed someone’s account, any broadcast information (posts) will appear in an updated feed which is called the timeline. The number of followers (total number of people followed) and followers (total number of people following) is always updated in a specific box on the Twitter profile page (Emeraldien, Sunarsono, and Alit 2019).

Figure 6 shows the distribution of clusters connected to the actors in presenting flood-related information. The most visible interaction is on the accounts @infoBMKG and @BPBDJakartam, the two accounts provide a fairly wide distribution in distributing related information, in this case the use of hashtags for each actor. This is the distribution and reception of information that is dominated by the general public, these two actors

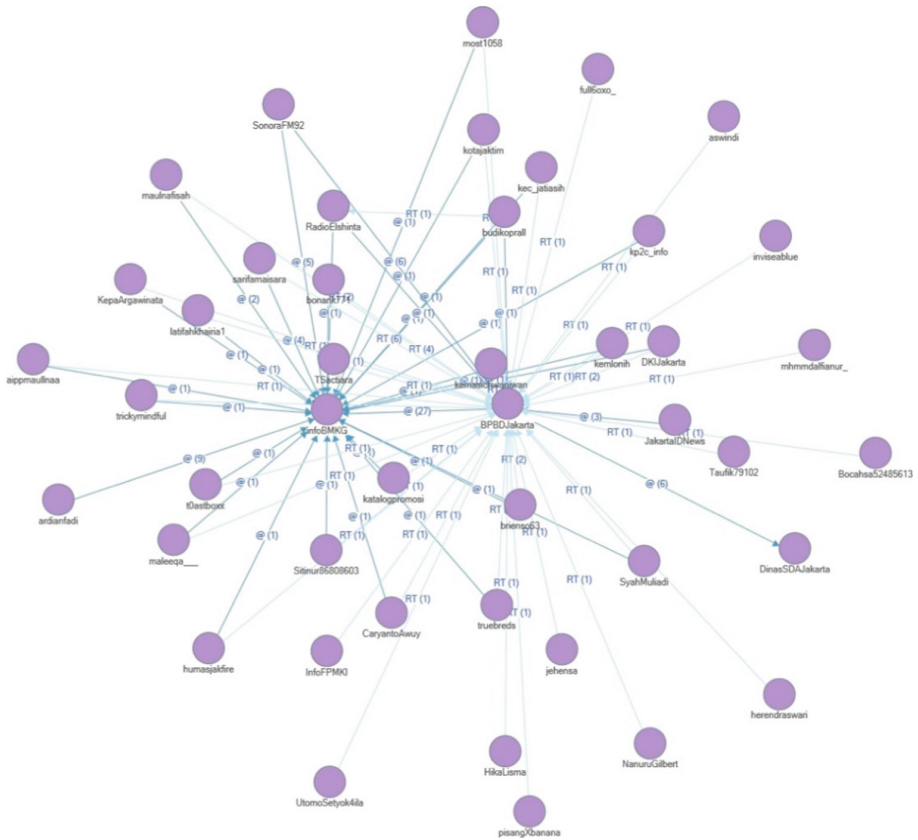


Fig. 6. Cluster search pada Twitter

are a link and source for the public to obtain information related to flooding in Jakarta, especially when an alert occurs and water overflows to the surface.

Referring to the explanation above, the author sees that Twitter users during the flood in Jakarta aka the tone of official information by the government through @BPBDJakarta accounts consistently and periodically. Media activity increased during floods, messages sent by the government and the public in the form of photos, videos during reports that appeared in the community. Thus, the social media accounts owned by the Jakarta Disaster Management Agency (BPBD) consistently provide periodic information both before and when there has been a flood.

5 Conclusion

The digital era has made the government adapt to using communication technology through the mass media to carry out information on mitigating Flood in Jakarta. Unlimitedness of communication through wireless channels helps the effectiveness and efficiency of government work in public services. In the midst of a flood situation, the

province of Jakarta actively communicates virtually via official Twitter account @BPB-DJakarta. The results concluded in this study include information on mitigating floods Jakarta's Twitter account. Significant results in this study include information on digital media, especially through Twitter, which can be used to influence the Jakarta government to make a serious commitment in dealing with flood prevention. There needs to be good disaster management, so that the response can be maximized, especially by providing education to the public, both through socialization through social media and directly to the community. Suggestions for further research development with the government's mass media activity is to analyze tweets, retweets, and hashtags on communication activity on Twitter to expand the analysis.

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