



Utilizing Information Technology to Fight the Spread of the Covid-19 Virus

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ABSTRACT

The lack of transparency at the beginning of the Covid-19 outbreak created misinformation in the public sphere. An infodemic is formed in the form of an abundance of information that makes it difficult for people to determine a valid source. The use of information technology with social media forms a significant role in influencing public behavior during the Covid-19 pandemic. The government also empowers information technology with social media as a public communication strategy. Accurate information is needed to identify the position of government social media in the Covid-19 infodemic. This study aims to obtain a comprehensive context from an open government perspective, namely transparency, participation, and collaboration so that the position of government social media and the Covid-19 infodemic can be identified so as to support a more optimal utilization strategy in handling the pandemic. This research uses a qualitative approach and collects various practices of using government social media in general and in the context of Covid19 in various countries as literature review material. The results of the literature study show that transparency is related to the optimal use of government social media, participation has relevance to public sentiment considering that participation has contributed to the development of the infodemic, while the scope of collaboration is a medium for grassroots interaction to encourage change for the better. The government is recommended to publish content quickly and accurately on platforms with high acceptance, utilize artificial intelligence, moderate toxic comments, and encourage participation towards collaboration between various parties.

Keywords: Covid-19; Social Media Information Technology; Open Government

1. INTRODUCTION

Since late December 2019, in Wuhan, People's Republic of China, an outbreak caused by a type of beta coronavirus has emerged. This epidemic spread rapidly from 1 city to the entire country and then the world in just 30 days [38]. The virus that causes the outbreak has similarities to the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), only that there are a number of amino acid changes so that it was later identified as SARS-CoV-2 [32].

The disease caused by SARS-CoV-2 was then referred to as Coronavirus Disease 2019 or Covid-19 and immediately became a worldwide concern, especially since it was declared a pandemic. The main cause is the high mortality rate. The case fatality rate (CFR) in the early period was reported to be 2.3%. This figure jumped dramatically to 8% in patients aged 70-79 years and 14.8% in patients aged more than 80 years. In a condition

of increasing cases of non-communicable diseases in the world, the danger from Covid-19 is increasingly contextual because the CFR in patients with non-communicable diseases or known as comorbidities is quite high, namely hypertension (6%), chronic respiratory diseases (6.3%), diabetes (7.3%), and cardiovascular disease (10.5%). Considering that specific treatment and preventive therapy such as targeted antiviral drugs or vaccines were not yet available in the early period of the outbreak, the focus of the handling was public health approaches such as isolation, quarantine, as well as social and community restrictions [38]

The lack of transparency at the beginning of the identification of Covid-19 created public misinformation thereby creating space for rumours and speculation to emerge in the public sphere [32]. The phenomenon of misinformation in handling disease outbreaks that can even accelerate the spread of an epidemic by influencing

and fragmenting social responses by Cinelli et al., is referred to as the infodemic. As for Islam et al., stated that the info emic relates to an abundance of information whether accurate or not which makes it difficult for people to find reliable sources or valid guidance when needed.

Infodemics are used to categorize rumours, stigma, and conspiracy theories during a public health emergency. In the 2002-2003 SARS outbreak, fear developed and created stigma in Asians, resulting in delays in medical efforts that contributed to expanding the epidemic through community transmission. In the 2019 Ebola outbreak in the Democratic Republic of Congo, misinformation led to violence, social chaos, and even attacks targeting health workers. In Italy in March 2020, a news agency published news about the lockdown in Northern Italy before the official government announcement. This resulted in people rushing to leave Northern Italy for the south which was later known to contribute to the increase in Covid-19 cases throughout Italy [10][20] [32].

Zhang, Pian, Ma, Ni, & Liu [40] in their study in China stated that the source of the Covid-19 infodemic was chat platforms such as WeChat (40.1%), video sharing platforms such as Tiktok (23.4%), and social media platforms. news sharing like Sina News (22.1%). The results of this study are in line with the simulation of the dissemination of information on social media using the epidemic model conducted by Cinelli in study research [10]. Using a model for measuring the spread of the virus, the reproductive values that lead to the occurrence of an infodemic were obtained.

Digital Data 2020 states that the total population in the world in 2020 will reach 7.75 billion people and as many as 3.8 billion (49%) of them are active users of social media. That figure grew 9.2% compared to the previous year. The global average says that the average time in a day spent using social media is 2 hours 24 minutes. The most popular platforms are Facebook, YouTube, WhatsApp, WeChat, Instagram, Tiktok, QQ, Qzone, Sina Weibo, and Reddit [21].

Social media plays a significant role in influencing the public during the Covid-19 pandemic because the public themselves tend to prioritize information from social media [2]. Bridgeman et al., [7] identified that there is a strong relationship between exposure to social media and misperceptions about Covid-19 and social media is also related to community non-compliance due to increasing misperceptions about Covid-19. At the same time, a public health approach as a strategy to deal with a pandemic requires community compliance itself [38].

The public's inability to choose information can create rumours and panic that create long-lasting effects, especially in the increase in Covid-19 cases. Given that

misinformation on Covid-19 is a matter of life and death, adequate intervention and appropriate communication strategies are a very crucial need [2] [29].

2. METHOD

The analytical method in writing this article uses a literature review with a literature review step consisting of 4 steps, namely selecting topics to be reviewed, searching for and selecting articles related to the topic, analysing and synthesizing literature, and organizing writings. The focus of the discussion topic in this article consists of a literature review on the use of information technology to combat the spread of the virus from various perspectives and theories. Another focus of literature review is related to the topic of information and communication technology literacy from various aspects. The two topics that are the focus of the study will lead to an explanation of the importance of technological, information and communication literacy as the key and support for the implementation of eradicating the Covid-19 virus.

3. RESULT AND DISCUSSION

Facing this abundance of information, the government is required to be able to provide fast and reliable information to the public in order to fight the current infodemic. In fact, in policies to stop the spread of Covid-19, both the government and health organizations have not been successful enough to provide reliable information to respond to the development of public information needs [25]. On the other hand, social media provides the government with an opportunity to communicate directly with the public. During a pandemic, spreading the message to as many people as possible is very important to reduce the spread of the epidemic [35]. This is related to an increase in individual activity to share thoughts, points of view, attitudes, and feelings on social media during the Covid-19 period [31].

The use of social media in government has become one of the main trends of e-government practice. Social media has an important role in the main areas of e-government, namely the flow and availability of information from the government, the use of information technology to create and provide innovative government services, the impact of information technology on government and public relations, and the increasing importance of policy and information technology in practice. democracy [13]. The use of social media in relation to government was increasingly recognized after the revolution in Egypt which used social media such as Facebook, Twitter, and YouTube massively [1].

From Mergel [27], the use of social media to increase participation, transparency, and collaboration between agents in the public sector is referred to as Government 2.0. Social media platforms are the main tools that enable

a two-way exchange of information, both within government institutions and through interaction with the public. Added Bonsón, Royo, & Ratkai [6] that interaction is an important element because social media creates an abundance of data as well as information that has the potential to raise questions regarding the accuracy, quality, and use of such data and information. One of the parameters that can measure these interactions is citizen engagement in the form of data processing from various activities carried out by the community on government social media [5].

The terminology of citizen engagement tends to complement the definition developed in the New Public Service paradigm. Denhardt & Denhardt [15] define citizen engagement as the ability of the community to be involved in a problem that is considered important by the community itself. Furthermore, citizen engagement can be built on normative boundaries within a democratic framework, or utilized in the implementation of public policies. Chen et al., states that citizen engagement tends to increase when dialogue occurs on social media platforms. Citizen's engagement then plays an important role in measuring public acceptance of messages conveyed by the government considering the importance of changing people's behaviour in efforts to overcome Covid-19 through a public health approach [9].

Research on the position of government social media in the Covid-19 infodemic has been carried out in various countries, such as Vietnam, Spain [19], India, Singapore, to Canada and the United States [28]. A comparison of the use of government social media in the context of Covid-19 between countries has also been carried out by Raamkumar, Tan, & Wee [30] to see the condition of the comparison. This research is here to summarize the achievements and problems of previous studies from these various countries so that a holistic context of government social media and the Covid-19 infodemic can be obtained which can be used as input for setting policies on the use of government social media in Indonesia.

The comprehensive context of government social media and the Covid-19 infodemic requires a relevant perspective. Mergel [27] emphasizes the importance of participation, collaboration, and transparency. Lee & Kwak [24] in an effort to explore social media-based engagement using the perspective of the Open Government Maturity Model (OGMM) which consists of initial conditions, data transparency, open participation, open collaboration, which ends with massive involvement. The two perspectives have a number of similarities which are also summarized by research on public sector communication in the COVID-19 era that puts forward the 3 pillars of Open Government, namely transparency, participation, and collaboration [25].

Mergel [27] who explores the concept of Government 2.0 defines transparency, participation, and collaboration

with 2.0 attributes. Transparency 2.0 is linked to the use of social networking technologies to increase accountability government. Through social media, the government is encouraged to be more transparent, including by publishing information that the public may not have wanted to know in the past. After all, the government is the owner of so much data that may be relevant to some or all of society.

The use of the internet and social media technology to connect the public with the government is referred to as participatory 2.0. The online interaction between government and society has actually emerged at the stage of Web 1.0 which tends to be static and not interactive. Web 2.0 which later developed into Government 2.0 allows for two-way interaction between government and society, such as in the comments column on Facebook pages, the use of Direct Messages (DM) on Twitter, and other methods [27].

The collaboration by Mergel and Khan is associated with social media disruption in hierarchies, Standard Operating Procedures (SOPs), and applicable laws in the public sector. In fact, hierarchies prove to be inefficient in the information search corridor given the limitation of vertical information. Social media shows a transformative effect for knowledge sharing in the field of public administration. Thus, this study aims to obtain a comprehensive context regarding government social media and the Covid-19 infodemic in the perspective of Open Government which includes transparency, participation, and collaboration.

In accordance with the aim of obtaining the holistic context, this research uses a qualitative approach. According to Creswell [10] efforts to obtain a complete picture of a problem involve various perspectives and use appropriate models to explain the phenomenon under study. The data used in this research is public data which includes the results of previous research that has been published through journals supported by other relevant data. Interpretation as an element of the discussion and drawing conclusions using the three dimensions of Open Government.

One of the notes from Sohrabi et al., [38] regarding the handling of COVID-19 in the early period of the outbreak is transparency. It is as if countries in the world have not learned from previous outbreaks such as SARS and Zika. The lack of transparency provides space to be filled by rumours, stigma, and conspiracy theories, which have the potential to reduce public confidence in both the government and international [20] In a number of countries, such as in Indonesia, public misinformation is then also followed by a lack of communication between levels of government, triggering the circulation of wrong interpretations through social media such as WhatsApp, Facebook, etc [16].

Responding to the development of the pandemic, each country has its own policies. In general, the Covid-19 pandemic shows that the crisis can encourage openness or even activate closure at the local, national, and international government levels [25]. In general, openness is one of the keys to successfully dealing with the pandemic. With clear case data, contact tracing can be carried out so that public health approaches in the form of isolation, quarantine, and community restrictions can be carried out in a directed manner. A number of countries, such as Vietnam, Taiwan, and Singapore, which are considered successful in controlling the number of Covid-19 cases, have implemented this approach. However, some countries choose to activate closure, such as Tanzania [10]. In its development, in line with communication patterns and policies of state leaders, the assumption that Covid-19 is a harmless virus reaches the public.

So many assumptions have developed about SARS-CoV-2 because at first—as a new disease—scientific and social knowledge about the origins and effects of this virus was minimal. This gives room for rumours to conspiracy theories that mainly target people seeking explanations [28]. In another perspective, Alfirdaus & Yuwono [3] mentions that policy makers are also faced with problems that have not yet been clearly defined, but have seen a massive and worrying impact.

Rumors can be disguised as infection prevention methods or control strategies that seem credible but have serious implications. Islam et al., [20] provides a number of examples. In Iran, there have been more than 800 deaths, 60 blindness and 6,000 people were hospitalized due to methanol consumption. This is related to rumours circulating those consuming high concentrations of alcohol can disinfect the body and kill viruses. Similar cases with the same rumours also occurred in 30 deaths in Turkey. Meanwhile in India, dozens of people experienced plant poisoning after watching a video on social media stating that Datura—which in fact is a poisonous plant—can provide immunity to Covid-19. Incidents of misinformation also occur at a higher level, namely the organization.

Research Papakyriakopoulos et al., [28] on 4 social media, namely Facebook, Twitter, Reddit, and 4chan, shows the fact that the origins of rumours to conspiracy theories are alternative sources, personal blogs, and social media uploads (83%). There are only 17% of rumours or conspiracy theories that develop from the mainstream media. However, from this small proportion, the number of shares on Facebook and Twitter is 4 times larger than alternative sources. At the same time, mainstream sources have wider reach and acceptance in society. Transparency by the government is the key to good handling of Covid-19. After all, the pandemic has had a significant impact on public confidence. A small or large number of people who do not trust the government,

the media, health practitioners, or scientists will affect the level of trust and the ability to rebuild relationships within the community. Furthermore, in public institutions, failure to gain trust can lead to loss of credibility, earned a bad reputation, and the result is public discontent. Governments in many countries must understand that the handling of the Covid-19 pandemic has accelerated the process of public distrust in a number of countries [25].

A study by Wong & Jensen [37] in Singapore stated that there are two pillars of communication towards transparency, namely conventional media and social media. The Singapore government uses WhatsApp as an element of social media and this is very relevant because of the 5.7 million population, 4 million of them are WhatsApp users. In this way, the government can disseminate up-to-date and reliable information to fill the space that previously allowed rumours to develop. Even when the first case emerged, the Singapore government transparently published contact tracing via WhatsApp, Twitter, Facebook, Telegram, and special websites. Information updates are also carried out 2-3 times a day.

Transparency through social media is also carried out by Vietnam. Before the first case was confirmed, government policy was focused on assessing possible threats, complemented by the development of guidelines to planning preventive measures to deal with new diseases. Vigilance in Vietnam itself has started since the increase in border quarantine on January 3, 2020. This was then supported by activities on social media to communicate information about the Corona virus to the public [23]. In its development, Vietnam and Singapore were quite successful in handling the Covid-19 pandemic with a controlled number of cases and a low death rate. This is a contradiction with what happened in Indonesia. The flow of information in Indonesia is quite slow, which is also supported by the lack of information regarding suspects, which creates a lack of information the urgency of emergency in the community [16]. In fact, a low perception of danger in the early phase of an outbreak is not an ideal condition. One proof is that when face-to-face schools were closed nationwide in mid-March 2020, a number of people actually took advantage of them to travel. In addition, Indonesia is also experiencing obstacles in the use of terminology such as outbreaks to social distancing.

Alfirdaus & Yuwono [3] emphasized that neither business as usual nor policies in crisis situations are sufficient to explain the Covid-19 pandemic. Moreover, this crisis has crossed the boundaries of certain regions and countries and has become a global issue caused by non-structural causes that are difficult to control and full of uncertainty in various aspects. One of the problems relevant to this is the fact in Iraq that panic arises not only because of misinformation, but also because of the release of factual information in the form of reports on

the number of cases and the number of deaths [2]. In Indonesia, for example, on the day of the announcement of the first case of Covid-19 on March 2, 2020, there was a density in markets and shopping centres because some panicked public took action to buy basic necessities. This means that the information that must be managed is not just misinformation, but also information that actually exists.

However, special attention to government transparency on social media in order to prevent the spread of rumours and conspiracy theories should remain a priority. Rumours, stigma, and conspiracy theories that side by side with public health emergencies are not new and have existed even since the Human Immunodeficiency Syndrome (HIV) period in Africa. According to Islam et al., [20] at that time HIV was rumoured to be exactly the same as Covid-19 today, that the disease does not exist and the treatment given is actually toxic to humans. This then created resistance to antiretroviral therapy (ARV) in South Africa. A similar incident also occurred in the Zika outbreak (2015-2016). In the case of Ebola, the misinformation circulating is also not much different, even saying that it was health workers who spread the virus. These conditions affect the ability of health workers to exercise control.

Learning from the experiences of HIV, Ebola and Zika, misinformation fuelled by rumours, stigma and conspiracy theories can have serious implications for public health, especially if it goes against science-based guidelines. Islam et al., [20] recommends that in managing information, the government should understand the patterns of rumours, stigma, and conspiracy theories related to Covid-19 so as to be able to develop appropriate risk communication messages. In line with what is currently going on Facebook, Twitter, and Instagram, a government or international institution such as the World Health Organization (WHO) should not only identify every rumour or conspiracy theory and then clarify it, but also involve related social media platforms to help disseminate the right information.

Rumours, stigma, and conspiracy theories actually follow three ways of thinking, namely: (1) the main narrative is the existence of a conspiracy related to individuals and powerful groups with specific interests; (2) its validity is based on circumstantial evidence or on the absence of evidence; and (3) arranged in such a way that it is difficult to refute, as for example by oversimplification by saying 'according to a study' or 'as mentioned in a book'. It should be noted that this kind of content tends to be much more viral than content that debunks or clarifies it [28]. Misinformation tends to occur among curious people who conduct online searches about how to deal with SARS-CoV-2 and those searches are potentially erroneous [4].

Transparency needs to be managed optimally so that apart from eliminating rumours and conspiracy theories,

it is also able to prevent stigma. Islam et al. (2020) mentions that stigma and fear of discrimination can contribute to transmission, especially health workers. Due to the stigma, people with Covid-19 symptoms will hide their symptoms and history of exposure when they check themselves into health facilities, so that officers who carry out handling with Personal Protective Equipment (PPE) at least become susceptible to infection, as happened in Bangladesh. Fear of stigma also triggers people to avoid getting tested, which is an important element in identifying the spread of an outbreak. It should also be noted that belief in rumours, conspiracy theories or the imposition of stigma does not have a direct correlation with factors such as education level. For example, patient 17 in Vietnam was a highly educated person from the upper middle class who refused to self-quarantine for 14 days and instead became part of the spread of the virus [23].

With the broad context of social media users, the government also needs to map out the recipients of information. As Singapore optimizes WhatsApp because of its large percentage of users, in Iraq the position is different because there is a tendency that men are more likely to use Facebook and Twitter, while women use Instagram [2]. The context is also different from Vietnam, which in addition to using Facebook because it is used by 57.34% of the population, also uses a social media called Zalo which has around 100 million users [23].

The transparency dimension relates to the optimal utilization of government social media, both in the creation and delivery of content to the public and the selection of the right medium for high acceptance, such as the use of WhatsApp in Singapore and local social media in Vietnam. Another important element to support transparency is the speed and accuracy in delivering information to the public. This combination can minimize the development of rumours and conspiracy theories that have the potential to influence people's attitudes and behaviour in handling the pandemic.

One of the things that encourage the development of rumours, stigma, and conspiracy theories on social media is that it is possible for someone to share messages with others regardless of whether the information is true or not. According to Apuke & Omar [4], in Nigeria altruism is the strongest predictor of sharing misinformation related to Covid-19 because it underlies actions with the intention of helping others by sharing information. Social media then facilitates the creation and dissemination of this information. Goel & Gupta mentions that the biggest strength of social media platforms is also its main weakness. Information is so easily accessible and available immediately, while the quality is not necessarily in line [17].

As explained in the previous section, information that is constructed from mere hypotheses can easily be

presented to a naive audience, creating rumours, stigma, and conspiracy theories in society. At the same time, forwarding or sharing news is an element of citizen engagement [6]. Pennycook et al., [20] emphasizes that basically everyone has a tendency to be restrained first if when they want to spread news questions arise about accuracy.

Participation is an important element of citizen engagement because through public participation by giving likes, writing comments, to sharing content, the government can assess the public's response to information created as a product of transparency. This became a criticism even long before the pandemic.

Medaglia & Zheng [26] who conducted a systematic literature review on a number of studies on government social media found that the existing research generally only focused on the government, not the community as users. In addition, the content provided tends to be a means of self-promotion instead of encouraging transparency, participation, or the provision of public services. Furthermore, these studies generally focus and stop on quantitative aspects such as the number of likes or the number of comments. Even if there is research that focuses on users, the problem is the same, namely stopping at the quantitative aspect.

In a number of recent studies on social media and Covid-19, development has begun. Research by Raamkumar et al., [30] compared content on the Facebook page of the Ministry of Health (MOH) Singapore, the Centres for Disease Control and Prevention (CDC) in the United States, and Public Health England (PHE) in the UK both before and after COVID-19. This research analyses the sentiments that emerge from the community on each content so that it does not stop at just engagement numbers. Measurements up to the sentiment level were also carried out by Chen et al., [9] for Weibo social media in China.

Regarding sentiment, research in Indonesia from Gustomy [19] shows an interesting fact because the Covid-19 policy discourse has actually become a war of sentiment between two poles of a populist cluster dominated by buzzers and a small number of influencers. The problem is the echo of buzzers with negative sentiments that tend to cover the voices of critical and rational groups. This study also portrays a debate that does not make sense in substance, namely between President Joko Widodo and the Governor of DKI Jakarta Anies Baswedan. The condition is that the two figures are both in government positions, although at different levels. The opposition then created rational anger from critical groups which unfortunately did not become trending topics. The presence of the buzzer itself then creates engagement that is not organic and causes positive discourse to become marginal discourse. From this research, it can be understood that the urgency to explore engagement is more than just trending topics and

the number of likes because it turns out that public participation is intertwined with buzzers who have their own interests.

Shoaei & Dastani [31] emphasized that social media with its network has great potential to encourage increased awareness and education related to Covid-19. In the early period of the pandemic, for example, social media was able to help control social restrictions and encourage people to avoid activities outside the home that are not very important. This is also driven by collaborations such as that of Spain and India [19][14].

In order to maximize public impression and engagement, two main features of government social media are needed. The first feature is content. While the second feature is account-specific things such as number of followers, position, institutional context, and activity frequency [7]. A number of studies have described the attributes attached to these features.

On TikTok social media, as researched by Q Chen, Min, Zhang, Ma, & Evans [8], a participatory picture emerges that shorter videos tend to get more engagement—in the form of likes and comments. On this native Chinese social media, news about the COVID-19 crisis itself tends to receive fewer likes when compared to content such as appreciation for medical personnel, handling by the government, as well as guidelines during the pandemic. On TikTok, positive titles tend to invite engagement from the public.

While on Weibo social media, research by Qiang Chen et al., [9] provides another perspective that media wealth is not associated with citizen engagement in the sense that plain text may trigger higher engagement than images. The interesting thing is that this fact was not agreed upon by the research from Yang, Deng, Zhang, & Mao (2021) which specifically examined the social media activities of local governments in Wuhan, the first epicentre of Covid-19. In this study, media wealth has an association with citizen engagement. Qiang Chen et al. [9] itself uses the example of Donald Trump's Twitter account which is barely ever made a post in the form of images and only plain text. However, in this context it is necessary to look again at Trump's position as the head of a superpower so that the engagement that occurs does not necessarily mean support for every tweet made.

Public participation is characterized by citizen engagement, by Q Chen et al., [9] are said to experience an increase when dialogue occurs on social media, either in the form of the use of certain hashtags, public responses to answer questions or make questions, as well as inviting or mentioning other accounts to be involved in the dialogue. It is this dialogue that forms the relationship between the public and institutions thereby encouraging citizen engagement. The interactions that arise from the government will show their attention to public opinion, so that the public then feels more

recognized and cared for so that motivation is formed to continue engagement.

In order to encourage participation, Teichmann et al. (2020) emphasize a number of things. First, under certain conditions sometimes the person who makes a post is more important than the post itself. In a sense, when an educational content of a community approach related to Covid-19 is created by national and regional leaders with a wide audience, the impact will be more significant. Second, concise messages that are clearly formulated tend to get more massive engagement. The content of complex messages such as in research on the development of chloroquine and hydroxychloroquine to drugs that already have Emergency Use Authorization (EUA) such as *remdesivir* and *favipiravir* tend to be difficult to get the same engagement with messages related to public health approaches such as washing hands, wearing masks, or keep your distance. Third, creativity, media, and media quality are very important. Information related to Covid-19 must be paired with the relevant media. For example, an explanation of the vaccine mechanism will be more relevant if it is presented in the form of a video or infographic instead of text. In other contexts, the use of influencer networks, pop culture references, and the use of celebrities can be an effective strategy, while messages related to extensive policies and messages in the form of videos and low-quality infographics tend to reduce engagement. Fourth, the government should pay attention to the method of delivering information on each platform. Messages on Facebook and Twitter may be the same, but the delivery method is very different, ranging from the size of the photo, the number of characters in the caption, to the use of hashtags. For Canadian use, videos get more engagement on Twitter while text messages get more engagement on Facebook.

To encourage public participation, social media strategies need to be formulated comprehensively and cannot be done immediately by making posts and then uploading them on various social media. It takes an understanding and the right content strategy, adapted to the audience on each social media, to be able to create public communication through government social media that gets participation and engagement from the public.

When it comes to engaging influencers, Vietnam provides a good example. Since the start of the pandemic, government social media has been supported by individual efforts to support public awareness and protection against the virus. For example, the song about washing hands ('Ghen Co Vy') by artist Quang Dang has gone viral and has been reproduced many times by netizens so that it has an educational impact. Quarantine—which is what distinguishes Vietnam from other countries in Southeast Asia—is also helped by positive news from a local fashionista named Chau Bui

with her video during quarantine which has attracted more than 1 million views [31].

However, one must also be wary of social media responses in the form of hoaxes, especially if it involves a famous figure. In Vietnam, it happened to the 17th patient involving celebrities and famous people. For this reason, Vietnam imposes a fine for spreading hoaxes with a value of up to 3-6 times the monthly minimum wage in the country [31]. Shoaie & Dastani emphasize that the use of social media for the spread of individuals during the Covid-19 pandemic allows for changes in individual behaviour in the community. However, he emphasized again the potential problems due to inappropriate information as a combination of the opportunity to share information on social networks with the lack of scientific monitoring of health information published on these networks. The impact on each person will be different depending on various aspects such as gender, age, to the level of education which in its implementation also cannot be averaged on the level of influence.

According to Sommariva, Vamos, Mantzarlis, o, & Martinez Tyson campaigns through social media can potentially be ineffective when there is an abundance of messages which then compete with each other on social media, thereby reducing the possibility of public health information being visible [33]. Especially when referring to the research of Sulistyawati et al., public knowledge on Covid-19 is actually quite good. However, some people who have a positive attitude towards Covid-19 have a tendency to respond negatively to government policies [34].

Negative responses to government policies are often associated with political preference factors. Gustomy's research can be used to refute this opinion because social media then becomes an arena for sentimental competition in political polarization that blocks the voices of critical and rational people. This is complemented by Pennycook et al., which states that there is no partisan relevance or not whether someone has concern or indifference in the context of Covid-19 misinformation. In the same research, it was stated that more than 1,700 respondents indicated that people share false information about Covid-19 because they fail to think about the accuracy of the content being shared. The important point is that there is a similar pattern to what happened in political hoaxes.

Social media has been understood as a favourite source of information [34]. Misinformation on social media can encourage people to choose effective treatment methods that are over-reactive or more dangerous perceive the pandemic is harmless so that they ignore health protocols which then have the potential to expand the spread of the virus (Pennycook et al., 2020). An example of a crisis created by information is the Zika outbreak in the United States (2015-2016). Sommariva et al., mentions that initially attention to Zika tends to be low because the symptoms are quite mild with a low

mortality rate [33]. However, attention increased after the discovery of evidence of fetal malformations in late 2015. Changes in the atmosphere on social media may occur due to information updates.

In the principle of participation, scientific publications play an important role to fight myths and to communicate adequate information quickly to the public and ultimately be able to suppress rumours and conspiracy theories. In Vietnam, scientific publications are used by the media and social media to disseminate information to the wider public. This is supported by a number of experts who use their own social media accounts to inform the community, for example Tran Xuan Bach, Associate Professor from John Hopkins University. In Indonesia, a number of health workers also use their social media platforms to simplify scientific publications, such as Bimo A. Tejo, PhD. (@ba.tejo) a biotechnology expert from Indonesia at Universitas Putra Malaysia, dr. Adam Prabata (@adamprabata) PhD candidate in Medical Science at Kobe University, to dr. Tirta who is a doctor as well as an influencer. The presence of these health workers is in line with the research results of Teichmann et al., that specific approaches are more effective to apply, especially in translating scientific and technical information into simple terms.

In anticipating misinformation on social media, the government can intervene early. The first way is to correct the information immediately through debunking or clarification. Unfortunately, a number of facts indicate that clarifications tend to be less viral than the original hoaxes, so the scope of correcting information is not as wide as the circulation of misinformation. For this reason, a second way is needed, which is to find out early on rumors that develop directly through their social media platforms to then be marked and reduce the possibility of being seen by more people by adjusting the algorithm [33]. Algorithm adjustment is important because it is stated by González-Padilla & Tortolero-Blanco that with the current bubble filter concept, the algorithm will direct the data to be displayed to one's preferences. Thus, if someone's preference is a conspiracy theory, then activity on social media and similar data will appear in internet searches [18].

Ramkumar et al., [30] offers public health-related authorities to consider the allocation of special resources for managing toxic comments on social media, as well as correcting circulating misinformation. On the CDC's account in the United States, toxic comments tended to be higher in line with the statement by the president at the time, Donald J. Trump, that SARS-CoV-2 was a Chinese virus which then sparked anti-Asian sentiment. Toxic comments deserve attention because research from Qiang Chen et al., [9] added information that the emotional valence contained in public participation was able to moderate the relationship between government social

media content and the engagement created. If the government fails to manage the emotional valence and richness of the media in the content it creates, it can trigger low engagement. On the other hand, if the government is able to adopt reciprocal dialogue, it can encourage citizen engagement. The bottom line is that these citizens can gain engagement with the public health approach which is a government policy so that they can help end the Covid-19 pandemic.

Qiang Chen et al., recommends the government to utilize Artificial Intelligence (AI) technology and cloud computing to analyse public needs and the changes required at each stage of the crisis [9]. Government social media can satisfy people's needs through adjustments to crisis information needed by the public. If public satisfaction is formed, it will encourage the influence of government social media in the eyes of the public so that it becomes the main information reference by ignoring misinformation on social media in general.

Measurement of sentiment on social media can also help authorities to measure the effectiveness of education [30]. Thus, the government can determine strategies to educate the public with the right social media [31]. This can also be an answer to Medaglia & Zheng's [26] criticism that properties on social media platforms tend to be under-researched so that it is different from the implementation of e-government at the beginning of its development because so much discussion is carried out on the website as the main platform. Measurement of this sentiment together with mapping of circulating hoaxes and relevant knowledge can be an effective policy formulation tool to reduce misinformation [4]. At the same time, the government is also encouraged to conduct reciprocal dialogue in order to optimize citizen engagement through good interactions [9].

In the end, optimization of citizen engagement, whether through the use of AI, moderation of toxic comments, as well as the involvement of influencers and figures from the health workforce to participate in encouraging education with excellent quality, must be supported by the provision of valid, effective, efficient, and effective information. and sustainability to the public through relevant channels to improve understanding of Covid-19. Furthermore, the current experience should be used by the government and other stakeholders to prepare for handling other pandemics in the future.

When referring to the definition of collaboration 2.0 introduced by Mergel [27], these elements have not been fulfilled by governments in various countries to date. The concept of collaboration 2.0 tends to resemble Wikipedia when both government and society collaborate on the same platform. In the context of dealing with Covid-19, this has not happened in many countries. In Spain there is a movement involving collaborative digital platforms but not directly involving the government. However, the movement, which is called 'Frena la Curva' or 'raise the

curve', was created to support government and public services. The systematics is by providing community needs, ranging from masks to books for elementary school students whose needs are displayed on a platform to then be met by other people who have excess [12].

The collaboration that has occurred so far is more of a participatory movement that leads to collaboration. In India, for example, in implementing a curfew, the government created the hashtag #JanataCurfew which was then supported by celebrities by creating affirmative content [12]. In Spain, the same thing was done with the hashtag #EsteVirusloParamosUnidos or together to stop the virus. The hashtag was designed as part of an institutional campaign on social media to raise awareness of the Covid-19 crisis and was later carried over to Spain during the lockdown period. The collaboration on this hashtag occurred because the accounts of the public health authority (@saludpublicaes), the national police (@policia), and the Ministry of Health (@sanidadgob) received many retweets from the public so that information dissemination was optimal.

Other collaborations carried out related to Covid-19 during the pandemic are the implementation of collaborative research and surveys through social media, including educational activities based on live online broadcasts via Zoom, YouTube, as well as Instagram and Facebook Live [18]. Various forms of collaboration even though they have not led to the ideal definition of collaboration 2.0 need to be maintained in order to maintain a positive context. According to Das & Dutta) in general, positive sentiment related to Covid-19 in public discourse is still slightly higher than negative sentiment [12].

Whatever approach is being taken, from the perspective of health, economy, public administration, or government, it all boils down to the same goal, namely a sloping curve. To be able to achieve this goal, collaboration of all parties is needed [25].

Social media remains an ideal instrument for education and communication considering its advantages in the form of rapid dissemination of educational content. However, it is important for the government to always pay attention to information circulating in the community because it always has the possibility of being out of date, not yet peer-reviewed, invalid, incorrect, irrelevant in certain environments, or even completely wrong [18]. As stated by Abdelsalam et al., in the context of the Arab Spring, social media is a relevant enabler and the magnitude of changes from year to year will encourage the realization of NPS, among others, through interaction at the grassroots level with the community to encourage change and reform in a better direction [1]. Collaboration, together with transparency and participation, is an important element in the governance of the Covid-19 infodemic on social media, which is a long-term war until the end of the pandemic.

4. CONCLUSION

The context of government social media and the Covid-19 infodemic can be seen from an Open Government perspective, namely transparency, participation, and collaboration. Based on the literature study conducted, it can be concluded that transparency is related to the optimal use of government social media, both in the creation and delivery of content to the public as well as the selection of the right medium for high acceptance. This is also supported by the speed and accuracy in delivering information to the public so as to reduce the development of rumours and conspiracy theories that have the potential to influence public attitudes and behaviour in handling the pandemic. From a participation perspective, the relevance is in measuring public sentiment on social media because the literature study actually mentions the role of participation in the development of the infodemic through the further dissemination of misinformation or interactions in the form of toxic comments on government social media. In the perspective of collaboration, there is no active interaction between the government and the public on one platform as the definition of collaboration 2.0. Thus, the scope of collaboration on social media is a grassroots level interaction medium to encourage change for the better.

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