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Mapping The Principal-Agent Relation In Social Media: A Data Mining Approach

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Abstract

Most of the research on social media is conducted to comprehend and to exploit the presence of public opinion in it. Meanwhile, there has been limited research that explores the engagement process and interaction results from social media accounts. Therefore, this study aims to map the interaction between government and society in social media in principal-agent context. Exploration made from tweets posted by @KemenDesa and citizens' tweets which are mentioning @KemenDesa dated from 1 October 2014 to 31 September 2017. The results give an idea of the engagement process and the content of the interaction so that the relationship between them in the principal-agent context can be mapped. In addition, the results of the analysis can also be used to evaluate the use of social media by public organizations and communities as an alternative medium to communicate.

Keywords: data mining, principal-agent, relation, social media, soft data.

INTRODUCTION

Social media is one of the phenomena that emerged in the 21st century. Nowadays, social media is not only used by communities, but also public organizations, politicians and so forth. Facilities provided like user-generated content (UGC), where users can create and modify their social media content, make social media one of the most popular research topics presently. It is understandable given that almost everyone uses social media on a daily basis. For example, Twitter, wherein 2017 already has about 330 million users and sends more than 500 million tweets per day containing thoughts, opinions, pictures, and other information (Statista, 2017b). Therefore, it is common for public organizations to improve its relationship with the community by using Twitter (Polunsky, 2014).

In addition to having its political power, social media today also become one of the most used communication media (Dahlgren, 2013;

Khondker, 2011; Shapiro & Hemphill, 2017). Several earlier research results indicate that social media can be used for various things, such as for policy advocacy (van den Heerik, van Hooijdonk, Burgers, & Steen, 2017), improving engagement, and public transparency (John Carlo Bertot, Jaeger, & Grimes, 2012; Chun, Shulman, Sandoval, & Hovy, 2010; Deschamps, Mcnutt, & Zhu, 2012; Haro-de-Rosario, Sáez-Martín, & del Carmen Caba-Pérez, 2016; Panagiotopoulos, Bigdeli, & Sams, 2014). Furthermore, data taken from Twitter can also be used to find out citizens policy preferences (Ceron & Negri, 2016; Koltsova & Koltcov, 2013; Sokolova et al., 2016).

Nevertheless, only limited research has been done discussed the establishment process of the relationship between government and society in social media as well as the factors that influence it. The Internet, in general, has also increased the ability of the community to interact with the government or its representative. The fact also shows that the use of social media proved to increase the intensity of interaction between state and society (Polunsky, 2014; Reddick, 2005; Thomas & Streib, 2005). Hence, the community, which is serving as a principal in this context, has the opportunity to get more information from the government or agent who uses social media. Conversely, the agent also can get the information related to what the principal desired. Hence one of the leading problems in the principal-agent relationship, asymmetric information, can be overcoming or minimized.

It can happen because the existence of social technology such as social media becomes a powerful tool for reinventing citizens-government relations (Picazo-Vela, Gutiérrez-Martínez, & Luna-Reyes, 2012). However, until now the type of relationship and how it is created still needs more exploration. Commonly, it can be explored using open data sources or Application Programming Interface (API), and by requesting authority to access data of the account owner. But, it will be troublesome to ask for government or other Twitter user authorization to use one of their social media accounts; it will take a long time to process. Furthermore, getting data through API has some limitations, both regarding amount and time (Mergel, 2017). Consequently,

making the analysis cannot be done thoroughly and deeply.

This article presents the answer to the question: How does the relationship between society and government occur in the social media? This study mainly aims to map the relationship between citizens and state in the context of principal-agent relation and to identify any factors that might influence it by using data mining approach, in this case, extracting longitudinal soft data (Severo, Feredj, & Romele, 2016).

The results of this study provide an explorative description of the relationship that occurs between the community and the government that is influenced by the advances in the field of information technology (Picazo-Vela et al., 2012). The results of this study also give a new dimension both in the context of the use of soft and unstructured data taken from the social media and the research on the relationship between society and government influenced by the existence of social technologies such as Facebook, Youtube, and Twitter. Also, it can be used as evaluation materials for public managers in using social media as one of the communication means.

This article is divided into four sections. The literature review section, presented in the next section, used to describe the conceptual framework of research followed by an explanation of the approach used in the study and the analytical methods. Then, research findings are discussed and concluded with conclusions, implications, and direction for further research.

Theory of principal-agent initially derived from economics, where the principal is the person who has the authority to give responsibility to the agent (Dür & Elsig, 2011). In the field of public administration, the agent is deemed to be the person who has the responsibility to act by what is required or desired by the principal or the citizens (Malmir, Shirvani, Rashidpour, & Soltani, 2014). In this context, the principal-agent model can be used to explain problems in the interaction between society and government, especially in the policy-making and implementation phases (Lane, 2013). The issue presents in one of the leading characteristics of the principal-agent relationship; that is the asymmetric information (Dür & Elsig, 2011).

The presence of such asymmetric information is due to the

inability of the principal to involve in every policy-making process. As a consequence, the principal loses the ability to advise on the frameworks and practices of decision-making (Kaskarelis, 2010). The typical solution usually offered is by increasing the interaction between the two parties. However, this solution requires a cost (control cost) which in theory tends to be undesired by the principal (Dür & Elsig, 2011). Therefore, the presence of social technologies such as social media is considered as a way to provide solutions to the fears of agency losses and to prevent spending control costs.

Before going further, note that up until now there is no single definition of social media acceptable to all. Some academics call it Social Networking Sites (SNS) (see Batorski & Grzywińska, 2017; Mazali, 2011; Mueller & van Huellen, 2012), while some others call it by directly referring to the names of the services like Facebook, Twitter, or YouTube. In this context, the social media typology created by Kaplan and Haenlaen (2010, p. 62) becomes more appropriate to be used to understand the social media. The typology is helpful not only to explain what social media is but also to distinguish whether it is social media or not. The social media typology is then updated by Chen (2013) as seen in Table 1.

Table 1. Social Media Typology based on social presence/richness media and self-presentation /self-disclosure

		Social presence/media richness/interactivity		
		Low	Medium	High
Self-presentation/ self-disclosure	High (anonymous)	Blogs (inc. Twitter)	Social networking services (e.g., Facebook)	Virtual social worlds (e.g., Second Life)
	Low (anonymous)	Collabo-rative projects (e.g., Wikipedia)	Content communities (e.g., Youtube)	Virtual game worlds (e.g., World of Warcraft)

Source: Kaplan and Haenlaen (2010, p. 62) in Chen (2013, p. 75)

Social media here can be understood as a web-based service where users can interact with each other and share messages as they wish. Distributing messages or information based on the wishes of the user is one of the leading characteristics of social media. It is called the user-generated content (UGC) feature. In this context, Twitter can be categorized as one of the social media with high anonymity and low interactivity. It means that although each party may share the message under their wishes, there is no obligation to interact except by deliberately mentioning other users in

a tweet. In other words, when a Twitter account was typing another username intentionally, it can be concluded that interaction has been established.

The use of social media by public organizations will make it easier for people to access more information (Kavanaugh et al., 2012). The use of social media by public organizations will make it easier for people to access more information (2014) who examined the use of Twitter to improve citizens-government relations. Meanwhile, other researchers conducted studies on the use of social media handled by the citizens.

Utilization of data obtained from social media can be done using various methods depending on the purpose of the research. For example, to map opinions from blogs, as Koltsova and Koltcov (2013) has performed, topic modeling can be employed. While, the relationship between society and government can be obtained from user activities such as reply, retweets, and favorites in the Twitter interface page or comments section (Haro-de-Rosario et al., 2016). It means that the relationship in the social media can be revealed by calculating the number of specific activities and by knowing the contents of the activity. Wills (2016) has argued that each technique used by researchers such as categorization and semantic tagging applies to almost all the humanity research methods. In this study, the relationship between the community and the government is seen not only from the presence or absence of the interaction but also extracted from the content of the communication. Therefore, based on the literature review, we define a conceptual framework to be used in this study as can be seen in Figure 1.

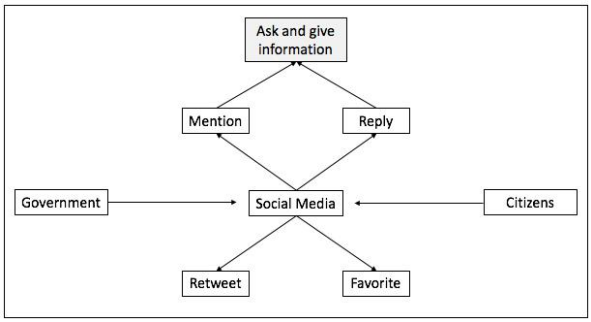

Figure 1. Framework for understanding Citizens-Government interactivity in social media in the principal-agent context

It is concluded from the previous discussions that social media allows interaction with anyone who uses it including government and society. Communication between users in the context of Twitter can be seen from several indicators: mentions, replies, favorites, and retweets made by users. Engagement established here can be used as a measure to

reveal relationships that occur based on the activities in the social media (Bonsón & Ratkai, 2013). Mentions and replies can be used further to find out the principal-agent relationship where each party can give each other information whether requested or not. In this context, content analysis can be performed on the tweets text.

Koltsova and Koltcov (2013) divide the literature which deals with the analysis of the text or unstructured data into two groups. First, the category which discusses the sentiments; Second, the type which discusses the topics covered in a collection of texts. The latter model is a text mining approach that is a new research area in the early development phase. Hence, the method rarely used in social science research (Koltsova & Koltcov, 2013). The underlying mathematical methods of text mining are still being developed by many researchers worldwide.

Regarding topics, previous research indicates that there is a tendency to discuss the utilization of social media by its users. Some of the applications can be seen from the following studies: (1) to advocate for policies (van den Heerik et al., 2017); (2) to collaborate and to increase public transparency (John Carlo Bertot et al., 2012; Chun et al., 2010; Deschamps et al., 2012; Haro-de-Rosario et al., 2016; Panagiotopoulos et al., 2014), and (3) to gain insight about citizens policy preferences (Ceron & Negri, 2016; Koltsova & Koltcov, 2013; Sokolova et al., 2016). Therefore, this study attempts to discuss topics that have rarely been addressed in research on social media and public policy, i.e., viewing them in the context of principal-agent relations.

As pointed out in earlier studies, the data used usually taken by using Twitter API. Despite its smooth implementation, acquiring Twitter data through the API has some drawbacks such as: (1) the amount of data is limited; (2) API periods cover only a maximum of the past seven days. Thus, the data collected cannot represent the content of the whole text. Therefore, in this study, we used a different method to get the Twitter data by manually saving the HTML sources of Twitter. Afterwards, we wrote codes using Python programming language to parse the HTML text into tweets information. As a result, we obtained more considerable data from Twitter over a more extended period, from 1 October 2014 to 31 September 2017.

Regarding data acquired, this research categorized as a new effort in revealing the influence of social media in the relationship between society and government.

RESEARCH METHOD

This research is an exploratory research using data mining approach from Twitter. The data used in this study are called soft data. The term 'soft data' refers to the type of data called 'big data', however, the difference is that soft data are more specific terms than big data. It is data that taken from the internet whose ownership rights are not regulated by the government but by the public or private parties (Severo et al., 2016). The data acquired are in the form of tweets posted by @KemenDesa and the communities that mention @KemenDesa from 1 October 2014 (around the time of the election of the new president) to 31 September 2017. It divided into six periods, six months for each one. @KemenDesa is an official Twitter account of the Ministry of Village, Development of Disadvantaged Regions and Transmigration of the Republic of Indonesia. The primary task of this ministry is to create and implement policies in the field of rural development, transmigration and empowerment of village communities. We chose @KemenDesa based on the results of preliminary observations started since July 22, 2017. Twitter account @KemenDesa is one of the accounts that endured the highest number of follower boost compared to other ministries Twitter account.

Before being analyzed, the data were first going through the preprocessing step. This step was used to prepare data so it can be interpreted directly (Feinerer, Hornik, & Meyer, 2008). In the preprocessing stage, data cleaning was performed in which removing some aspects of tweets such as common words, links, and images. Afterwards, the data in the form of tweets were analyzed to find out the user engagement which was calculated based on the number of retweets, replies, and favorites. The analysis then focused on knowing the contents of community's tweets replied by @KemenDesa, and @KemenDesa's tweets responded by citizens to find out the relationship in the context of principal-agent relation.

Content analysis was done using probabilistic topic modeling with Latent Dirichlet Allocation (LDA)

algorithm. Topic modeling here can be employed to find the central theme of a large and unstructured text document (Blei, 2012). It is currently one of the enhancements that can be used in some programming languages such as Python or R with topic model packages installed (Grün & Hornik, 2011). Previous research which also used topic modeling in the similar context was conducted by Koltsova and Koltcov (2013). In that study, topic modeling was used to map the topic of discussion of LiveJournal blog in Russia. One of the main issues in analyzing text through topic modeling is the selection of the proper number of topics which is a predetermined variable in topic modeling algorithm. A method to determine the amounts of topics based on perplexity has been proposed (Blei, Y.Ng, & Jordan, 2003). In this research, such a method is used to find the proper topic number from the text documents in the form of tweets text. Here is an example of the perplexity of the first period data. Where the number of top-probability topics to compose a latent-topic is two topics.

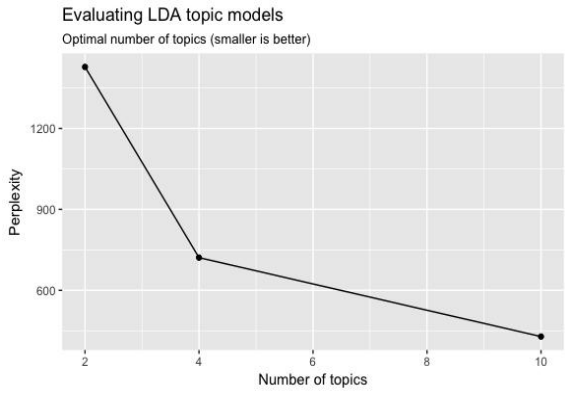

Figure 2. Sample of perplexity taken from 1st period data (Source: Obtained from primary data)

DISCUSSION

Social media developed in Web 2.0 and containing User Generated Content (UGC) facilitates interaction between users. Social media becomes essential to disseminate information from the ministry to the community. Instead, the public organization can also get feedback from tweets posted by 38.7 million active Twitter users in Indonesia (Statista, 2017a) containing opinions, ideas, pictures, and so on. Therefore, the interaction between social media accounts owned by the citizens and @KemenDesa, can give us an idea of how the relationship between society and government occurs in social media.

Our observations showed that @KemenDesa has 484.000 followers and has been posted 8,848 tweets in period 1 October 2014 to 31 September 2017. Within that period, tweets uploaded by @KemenDesa got 11,817 replies, 117,967 retweets, and 118,627 favorites. We divide the total period into six periods consisting of six months for each one to make it easier to be analyzed. Figure 3 shows the total number of tweets posted by @KemenDesa per six months.

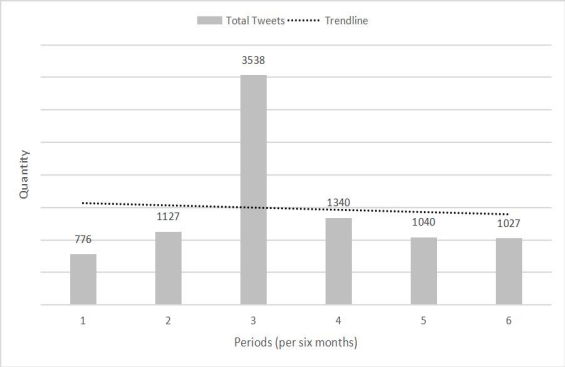

Figure 3. The number of tweets posted by @KemenDesa (Source: Obtained from primary data)

On average, every six months @KemenDesa posted 1475 or 246 per month. Tweets posted by @KemenDesa account may not considered frequent, but successful in term of increasing the intensity of interaction between the ministry with the community. This fact indirectly confirms the thesis stated that the presence of social technology could be a useful solution to improve the relationship between citizens and government (Polunsky, 2014; Reddick, 2005; Thomas & Streib, 2005). Figure 4 presents the interaction between government and citizens in which we can see the tendency of Twitter users' responses to increasing despite the trend of the number of tweets posted by @KemenDesa account is decreasing.

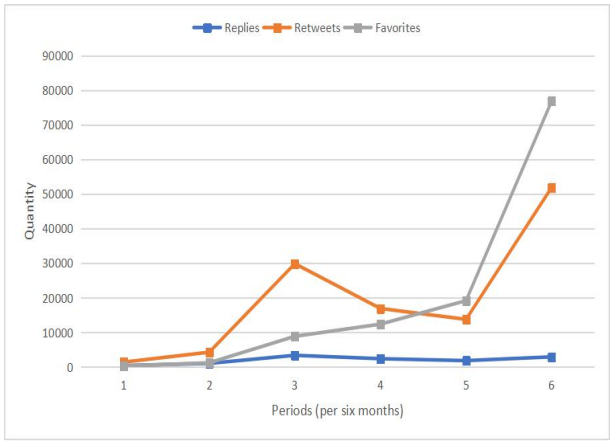

Figure 4. Number of replies, retweets, and favorites of @KemenDesa's tweets (Source: Obtained from primary data)

From the data, we can see that the activities of public organizations in social media can improve the relationship with the community. In this context, the response of Twitter users to the tweet posted by @KemenDesa can show the interactivity. Nevertheless, it has not been able to explain the relationship of government-citizens created in social media in the principal-agent context in which one of its main characteristics is the presence of asymmetric information. In other

words, we need to know the tweet content posted by both the @KemenDesa account and the community account. In this context, the tweet content posted is very likely to affect other Twitter user responses. For that, the next table will show the topics of the tweets posted by @KemenDesa.

Table 2 shows the result of topic modeling for each period. The appearance of the word "program" in each period indicates that the @KemenDesa is consistently used to share information related to the policies implemented by the ministry. Interestingly, general topics and topics from tweets that get replies, retweets, and favorites do not show any noticeable differences as can be seen in Table 3. In which the word "program" also regularly appears in each period.

From Table 3 we know that the words "program" and "socialization" almost always appear in each period. Therefore, it can be assumed that the tweet content that tends to make people interested in interacting with government social media accounts is a tweet that provides information about the activities undertaken by the ministry. In other words, the public as the principal is likely responding to information about what the agent does. Also, the emergence of the word "come on" also shows that the @KemenDesa account is used to invite the community to be involved. The topic of the solicitation indicates an attempt to use social media to increase citizens' participation in which it has also been mandated in the decision of the Minister for the Utilization of State Apparatus and Bureaucratic Reform (KEMENPAN-RB) No. 83 of 2012 on the use of social media government agencies.

To this point, we can note that the government-citizens relationship in social media can be seen from their interactivity in social media as said by Haro-de-Rosario et al. (2016). In this context, the number of posted tweets does not seem to have a direct relationship with the number of responses (reply, retweets, and favorites). In contrast, tweet content that provides information needed by the public as a principal and posted consistently has a tendency to make interaction increase over time. However, to prove the relationship we must undertake a more in-depth study of what affects the relationship between citizens and government.

Table 2. General topic models of tweet posted by @KemenDesa. All words have been translated to English

Period	1	2	3	4	5	6
Topic 1	program; minister; malaysia; result; similar	program; live; transmigration; event; more	program; minister; result; together; event	together; java; big; republic of indonesia; billion	together; water; satellite; socialization; ready	acquire; together; hello; yes; stop by
Topic 2	transmigration; more; together; photo; socialization	together; partner; area; minister; maros	more; acquire; come on; transmigration; student	socialization; program; team; acquire; more	program; acquire; more; social; continue	program; wrong; more; ready; see

Source: Obtained from primary data

Table 3. Topic of tweets from @KemenDesa which getting replied, retweeted, and favorited. All words have been translated to English

Period	Topic of tweets					
	Replied		Retweeted		Favorited	
	Topic 1	Topic 2	Topic 1	Topic 2	Topic 1	Topic 2
1	more; transmigration; new; result; web	program; minister; socialization; strategic; cashed	minister; photo; official; result; similar	more; cashed; student; talk; malaysia	program; together; wow; temporary official; republic of indonesia	more; transmigration; sari; progressive; student
2	program; come on; acquire; more; minister	live; together; date; java; watch	transmigration; partner; come on; acquire; afternoon	program; event; area; more; national	together; more; acquire; commission; cashed	program; area; water; exhibition; afternoon
3	west; together; result; java; water	program; come on; night; acquire;more	program; more; night; come on; acquire	minister; together; event; west; result	result; java; event; afternoon; water	together; live; national; development; ready
4	more; big; road; night; royong (mutual cooperation)	together; socialization; java; team; program	java; team; acquire; billion; road	program; republic of indonesia; big; ready; afternoon	together; program; java; more; come on	socialization; big; side; potency; beginning
5	program; acquire; water; continue; about	together; hello; socialization; more; giving	water; continue; giving; please; more	program; acquire; together; socialization; wrong	together; program; water; social; giving	acquire; continue; satellite; about; sharing
6	acquire; together; hello; corporation; ready	program; yes; more; see; west	together; corporation; republic of indonesia; partner; continue	acquire; program; ready; booster; continue	see; corporation; republic of indonesia; partner; booster	acquire; program; together; yes; stop by

Source: Obtained from primary data

Based on the definition of social media created earlier, here we can also understand that government-community relationships in social media with web 2.0 base occur interactively. That is, the government is not just a single actor as a giver of information. Also, social media with UGC facility also allows the community to be able to create content according to their wishes that can be utilized by the government in the decision or policy-making process. Therefore, an understanding of the tweets of people who are mentioning the @KemenDesa account is also essential to understand the principal-agent relationship in social media. So, we can associate the tweet content of both parties and achieve our understanding of the principal-agent relationship that occurs in social media.

Polunsky (2014) said that Twitter is perceived as a communication tool which is fast and easy so the citizens can accept it. In this context, the ease of using Twitter to be used indirectly can also increase the intensity of communication between citizens and government. The communication intensity can be seen in Figure 5, where from the data note that the tweet mentioning @KemenDesa account tends to rise. In other words, the public's desire as principal to communicate with agents also increased. Accordingly, the number of mentions to the Twitter account of the Ministry also indicates that social media can be used to strengthen government relations with the citizens.

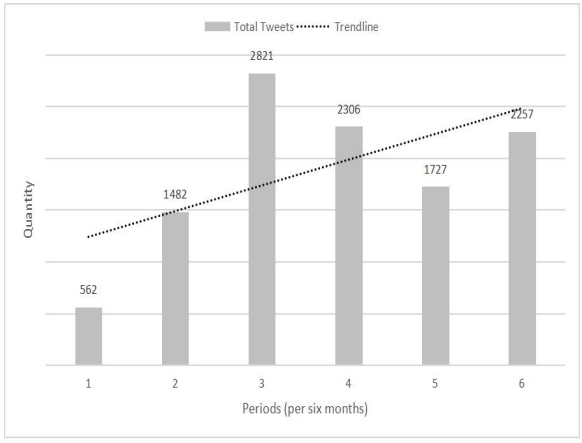

Figure 5. The number of tweets posted by citizens mentioning @KemenDesa
Source: Obtained from primary data

Interestingly, Twitter user activity that takes account @KemenDesa also invites other users to interact. The interaction that occurs can be seen from the number of different twitter user responses to the tweets mentioned @Kemendesa account as can be seen in Figure 6. Here we assume that they have the same needs with tweets that they reply, retweet or favorite. Here the exploration that we are doing once again shows that social media can be used as a means to increase the

interaction between government and society where people with social media accounts can also trigger other users to interact.

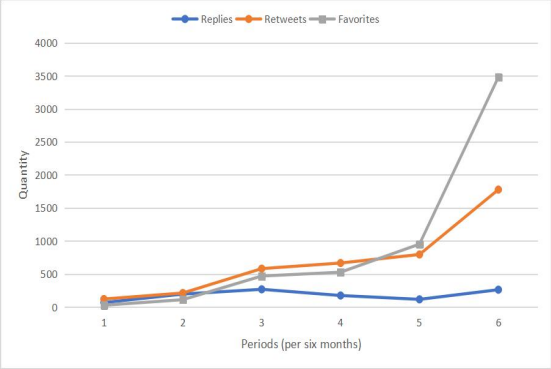

Figure 6. Number of replies, retweets, and favorites of citizens' tweets mentioning @KemenDesa
Source: Obtained from primary data

In line with the number of tweets from @KemenDesa, the number of user interactions on Twitter that occurred through the @KemenDesa also increases. So it can be said that the use of social media by public organizations can encourage the participation of democratic and engagement as disclosed by Bertot (2010). However, Figure 6 also shows that the interaction in social media is more common in the form of retweets or favorites. The number of replies tends to be less than the number of retweets and favorites either in the tweets posted by @KemenDesa or the accounts that mention @KemenDesa. The low number of reply in this context can be understood because it requires more effort than retweet or favorite.

In the context of the principal-agent interaction that has been proven to occur between the citizens and the government also needs to be understood through its content. For that next, we create a topic from tweets that mention @KemenDesa. Table 4 below shows the topics that appear from citizens' tweets addressed to Twitter belonging to the village ministry.

Table 4. General topic models of tweets posted by citizen

Period	1	2	3	4	5	6
Topic 1	program; minister; april; ready; similar	program; web; date; east java; ready	java; province; west; acquire; more	program; more; method; similar; wrong	program; more; together; west; water	program; ready; together; big; water
Topic 2	more; result; acquire; through; attention	java; acquire; sorry; province; file	result; program; west java; ready; cashed	test; acquire; result; cashed; west	ready; method; similar; java; result	through; more; acquire; method; test

Source: Obtained from primary data

From the topics obtained (Table 4), it is known that people tend to use Twitter to ask things about ministry programs. In this context, it can be seen from the dominance of the word "program" that appears almost all the time. Also, some words that show time and region such as “april,” “java,” “west,” “east java,” as well as some specific terms such as "pnpm" (national program for community empowerment) and "transmigration" are present. With that knowledge, we can assume that the people who interact with @KemenDesa are from Java island who wants to get the information about the specific terms. The next question that arises is whether the ministry responds the tweet from them. To find out the answer, we did a mapping of interaction content obtained from tweets that got responses from @KemenDesa (Replied by), and tweets used as replies by @KemenDesa (Replied to). It is shown in Table 5.

Table 5. Topics and Number of Citizens’ tweet replied by @KemenDesa (replied by) compared to the tweets posted by @KemenDesa mentioning other Twitter accounts (replied to)

Topic	Replied by	Replied to
1	exist; what; budget; area; mentor; already; announcement; congratulation	village; please; or; will; already; in; we; Bumdesa (business entity owned by village); can
2	can; request; exist; budget; area; administrator; when; how; phase	village; budget; exist; no; province; KemenDesa; will; already; still

Source: Obtained from primary data

Out of a total 11,155 tweets posted by citizens mentioning @KemenDesa, only 1.3% of which are replied by @KemenDesa account. Some topics from citizens’ tweets which get a reply have related the terms "mentor," "announcement," and "budget." On the other hand, the topics of the tweets that were replied by @KemenDesa are not too readable, although we may assume that the answer is in the form of information. For instance, a tweet from @suheriqincai asking about the mechanism of changing the online registration data by writing a tweet:

> *“@KemenDesa kemaren saya sudah isi data di pelamar online diweb, apakah data saya itu bisa dirubah kembali, karena ada yg salah, gmn caranya?”* (@KemenDesa yesterday I have filled the online registration. Can it be changed, since there is something wrong, how?).

It got the following reply from @KemenDesa,

> *“Jika terkendala dgn online silahkan daftar via ofline, kirimkan berkas ke Satker Provinsi masing2 ** @suheriqincai”*

(If having problem with the online system, please do the offline one. Send files to the work unit in each province ** @suheriqincai).

The tweet reply from @KemenDesa describes how to change the data in question. The explanation can be determined by profoundly checking the conversation. In the case of small length text, it may still be possible. But for lengthy text, an automated way is required. Therefore, here we try to find the correlation of each word in the document. The words we focus on are the tweets from citizens consisting question words, such as "what," "why," " when," and " how." While from replying tweets we focus on the word such as "please," "will," "already," and "still."

Table 6. Topic Association

Citizen's Topic			@KemenDesa's Topic		
Topic	Top Words	Highest	Topic	Top Words	Highest
What (asking object)	complain; sms (short message service); telephone; purpose; oversee; enlightenment; benefit	0.46	Please	talked; downloaded; through; read; musdes (village meeting); mister; center; local	0.41
What (asking condition)	explanation; want; register; stated; etc; accepted	0.36	Will	held; media; later; so far; telephone; east; announced; active; java; selection; local; held; province; not yet; via; participant; if; still; Indonesia; kemendesa; continue; accepted; pmd (an institution for village empowerment); ppbj (a superintendent of goods and services)	0.61
When	announcement; registration; yes; ministry; seems; announce; approximate; registration; sumatera; last; end; started; announced; daily; thought; recruitment; jepara; cashed	0.45	Already	what; data; criteria; fulfill; requirements; next; attached; kades (head of village)	0.52
How	village; name; district propagation; registration; show; object; batik	0.40	Still	process; watch; announced; panselnas (national selection committee); held; media; later	0.71

Source: Obtained from primary data

Table 6 shows that the tweets of citizens who use the questionnaire word related to information about ministry activities involving the citizens. Meanwhile, when viewed from the response of @KemenDesa, we also know that although the number is not much, the tweets replied are enough to offer clues. Thus, even though it cannot be regarded as an answer, at least the replying tweets give the direction to which citizen must dig the information it needs. The information provided by @KemenDesa indirectly also proves the opinion of Kavanaugh et al. (2012) which said that the use of social media by public organizations could make it easier for people to get the information they need.

In summary, the data obtained indicate that the Ministry of Village (@KemenDesa) has used social media as a tool to convey information on activities they carried out. It is not only easier for people to get information, but also makes people have an alternative way to seek more information. Therefore, communities then grow to use Twitter as one of their tools to connect with the ministry. Also, from this research, it is known that not only the government that distributes information but also the communities. On the one hand, the government can share information about its activities. While on the other hand, the public can also provide information about what they need to the government or the ministry concerned.

The exchange of information between the public organization and public social media account can make the principal-agent relationship better. In this context, the inequality of ownership of information that so far characterizes the principal-agent relationship can be minimized. Also, based on the data obtained is also known that Twitter account @KemenDesa can be one of the trigger interactivity that occurs in social media. Therefore, to build relationships with today's society, the government should have and use its social media accounts to share information consistently. Also, social media account managers should also be more responsive in responding to questions raised by the public through social media.

CONCLUSION

The primary purpose of this article is to find out how citizens-government relationships occur in social media in a principal-agent

context. From the studies conducted it can be seen that the relationship between society and government occurs in social media, in this context on Twitter that can be seen from the interactivity that happened where the tweets posted by @KemenDesa get responses from the community. In this context, interactivity can also be seen from the tweet content posted by both parties, where on one hand the Ministry of Village through the @KemenDesa consistently shares information about their activities. While on the other hand, people use Twitter to ask things they want to know. People tend to search for information about activities undertaken by ministries in which they are also directly involved in village counseling selection activities.

Here we also agree with Vela et al. (2012) who said that information technology is a powerful tool to strengthen the relationship between government and society. Increasing tendency of the connection can be seen from the number of responses received by @KemenDesa and other Twitter user responses to the tweet that mentions @KemenDesa. Therefore, we also agree with Dür and Elsig (2011) who said that social media could be a potential tool to deal with problems of citizens-government communication, especially asymmetric information. The use of social media to share activity information such as that performed by @KemenDesa can consistently be a solution to asymmetric information. Nevertheless, the social media account manager of the ministry should be more responsive in answering questions asked via Twitter.

In the principal-agent context, where the community as principals have the right to obtain the information they need we suggest that social media organizers of public organizations have unique hashtags to facilitate interaction while identifying community needs. For example, to assist frequently asked questions, the manager can use the #tanyakementrian (#asktheministry) or more specific one such as #tanyakemendesa tags. While to provide information related to the activity, they can use #infoactivity hashtag and explain what the policy can, for example, using #policydesa and so forth. By using these hashtags, it will also facilitate the process of utilizing soft data for public

organizations in the policy-making process.

Research using data from social media or soft data is still in the early development stage. So, although there are many methods developed by scientists, there are still some limitations. For example, text mining, although this technique is said to be used for almost all types of text (Koltsova & Koltcov, 2013), but especially for non-English language, it still has some shortcomings that still need to be developed further. Development is also required to normalize text and analyse sentiments. While related to the use of social media by public organizations and their influence on principal-agent relationships, our study still has limitations because it uses only one sample and is in the exploration stage. Our research ensure that social media can be used to increase the intensity of interactions between principals and agents. For that reason, further researches are needed with larger sample size and measure its influence on trust, satisfaction, and quality of the relationship that occur in the social media.

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