Roles of Social Media in Open Data Environments: A Case Study of the 2014 Indonesian Presidential Election Voting Results

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Abstract

Open data initiatives are critical to open government policies which promote transparency, citizen engagement and collaboration. However, they face challenges in realizing their potential benefits through citizens' active engagement. Despite the sharp rise of social media use by governments or quasi-governmental organizations to engage citizens in transforming public service quality and offers, very little has been written on enabling roles of social media in influencing the outcome of open data initiatives. This research examines the potential enabling roles of social media in motivating and having citizens' engagement easier in open data environments. Specifically, we present social media use in supporting citizen-sourcing initiatives in response to an open data initiative. We examined the 2014 Indonesian presidential voting results by the Indonesia General Election Commission as the case study context. Our study proposes two complementary roles of social media in enabling the realization of the benefits from opening election voting results transparent.

Keywords

Open data, open government, social media, crowdsourcing, citizen-sourcing applications

INTRODUCTION

Open government data or other similar terms have been used in the recent open government initiatives to promote transparency through the use of Web 2.0 technologies (Bonsón et al. 2012; Chan 2013; Janssen et al. 2012; Linders 2012; Sandoval-Almazan and Gil-Garcia 2012; Sayogo et al. 2014). Open government data implementation refers to opening and sharing government-held data with business and citizens (AlAnazi and Chatfield 2012) and is one of the critical means or mechanisms for advancing the participatory open government policy initiated by Obama's administration (US Executive Office 2009). Since 2009 the similar participatory open government policy initiatives have been widely spread across the world (Bonsón et al. 2012; Linders 2012; Sandoval-Almazan and Gil-Garcia 2012). The main aim of open government policy is to encourage government to promote transparency, involve citizens' engagement and inter-government collaboration to improve the effectiveness of the government decision-making and its public services delivery. Similarly, the open government data initiatives also aim to promote transparency by enabling the citizens to uncover what government does, attract citizens' collaborative engagement to solve complex societal problems and create value for the public (Jetzek et al. 2013; Kassen 2013).

The open government data initiatives encourage governments to provide their data open and make them easily available for the public. There are two elements of the open government data: government data and open data (Ubaldi 2013). Of the key feature of the open data is that the data should be publicly available for usage and distribution (Janssen et al. 2012). By allowing the data to be reused and distributed, exchange information between government agencies and/or the public is expected to facilitate the collective actions or decisions (Sandoval-Almazan and Gil-Garcia 2012). These collective actions often provide real time and community-wide coordination (Linders 2012). Current trend shows that social media creates the opportunity for real time and community-wide coordination between government, non-profit organization and the citizens that increase participation of the public in collaborating with their government (Chatfield and Brajawidagda 2014; Linders 2012). Thus, social media plays an important role for the citizens to participate in an open data initiatives by providing the critical capability for real-time and community-wide coordination.

To date, research attention has been given to the government efforts in realizing the benefits of the open data initiatives (AlAnazi and Chatfield 2012; Janssen et al. 2012; Neuroni et al. 2013; Veljković et al. 2014; Zuiderwijk and Janssen 2014). Despite the important role of the citizens in e-government initiatives and the rise of social media use in enabling the collaboration between citizens and government (Bertot et al. 2010; Reddick 2005), little is known on enabling roles of social media in influencing the outcome of open data initiatives. Therefore, this research raises the central research question: *How does social media play its roles in an open data initiative*? To answer this research question, we employ a case study research on the Indonesia General Election Commission's (KPU) open data initiative during the 2014 Indonesian presidential election voting. This research contributes to reduce the gap in the literature by proposing two complementary roles of social media in the open data initiatives environment.

The reminder of this paper will be structured as follows: in the next section we present our literature review on social media and open data initiatives. In the subsequent section, we present the context of the case study. Following that, we describe our research methodology. Subsequently, we present our findings including the KPU's open data initiative, citizens' initiatives in responding to open data initiative and citizens collaboration with government through the use of social media. Finally, the last two sections are discussion and conclusion.

LITERATURE REVIEW

Social Media

In recent years, social media has been widely adopted and used not only by individuals but also private and public organizations (Bonsón et al. 2012; Culnan et al. 2010). Social media is "a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content" (Kaplan and Haenlein 2010, p. 61). While there has been a significant increase of a variety of the social media platforms, however, social media platforms can be broadly categorized into social networking (Facebook, hi5, tagged), media sharing (Flickr, YouTube), blog (blogspot, blogger) and microblog (Twitter, Plurk, Tumblr).

Social media has been notably used in disaster management (Bird et al. 2012; Chatfield and Brajawidagda 2013b; Chatfield et al. 2013; Chatfield et al. 2014; Yates and Paquette 2011) which is beyond the traditional context (e.g. marketing, CRM and recruitment). More recently, the literature shows the use of social media for government transparency (Chatfield and Brajawidagda 2013a), budget transparency (Zhang and Chan 2013) and government election transparency (Adams and McCorkindale 2013; Chatfield et al. 2012). Social media is also viewed as an effective means not only for the government to communicate with its citizens, but also for citizens to actively interact and even collaborate with their government (Chatfield and Brajawidagda 2014; Linders 2012). Despite the growing literature on the open data and social media roles in promoting government transparency, however, roles of the social media in the open data initiative remain uncovered and unclear.

Open data initiatives

To date there has been no widely accepted definition of open data. For example, the European Commission's Information Society Thematic Portal (2014) broadly defines open data as "the idea that certain data should be freely available for use and re-use" at the use level. More narrowly at the data level, the Open Knowledge Foundation (2012, p.6) defines open data as "the data that can be freely used, re-used and redistributed by anyone subject only, at most, to the requirement to attribute and sharealike". Similarly, Janssen (2012, p. 258) refers open data as "non-privacy-restricted and non-confidential data which is produced with public money and is made available without any restrictions on its usage or distribution". Despite the variance across the existing definitions, however, they tend to agree on the common attributes of the open data: being publicly available, free to be used and free to be distributed.

At a global level of the open data initiatives, Open Government Partnership was formed to continuously support high-level leadership commitment in order to promote governments to be more transparent, accountable and responsive to their citizens' needs. As of July 2014, 64 countries across the world participate in the Open Government Partnership (Open Government Partnership 2014). This 2014 figure indicates a significant increase in interests in opening government-held data, up from 46 countries in the 2012 (AlAnazi and Chatfield 2012). Despite the significant growth of membership, we found the lack of empirical research on the open data initiatives. Table 1 shows empirical researches on open data initiatives in the e-government literature. Based on Table 1, the open data initiatives are dominated by developed countries such as US, Netherland, Singapore, and Switzerland (Chan 2013; Janssen et al. 2012; Kassen 2013; Neuroni et al. 2013; Sayogo et al. 2014; Veljković et al. 2014; Zuiderwijk and Janssen 2014) and there is still a critical gap on the open data initiatives in the developing countries (AlAnazi and Chatfield 2012; Sayogo et al. 2014).

Table 1. Empirical Researches on Open Data/Open Government Data

City/Countries	Developed/Developing	Method	Source(s)
Middle East Countries	Developing	Web Survey, Benchmark	(AlAnazi and Chatfield 2012)
Chicago/USA	Developed	Case Study	(Kassen 2013)
USA	Developed	Benchmark	(Veljković et al. 2014)
The Netherland	Developed	Case Study	(Zuiderwijk and Janssen 2014)
The Netherland	Developed	Case Study	(Janssen et al. 2012)
Singapore	Developed	Case Study	(Chan 2013)
Morocco, United Arab Emirates, Ghana, Kenya, India, U.S and international organization for Case Study. 35 countries for web content analysis	Mixed	Web Content Analysis, Benchmark and Case Study	(Sayogo et al. 2014)
Switzerland	Developed	Case Study	(Neuroni et al. 2013)

Of these empirical studies, attention has been mostly given to the government-side efforts (AlAnazi and Chatfield 2012; Janssen et al. 2012; Neuroni et al. 2013; Veljković et al. 2014; Zuiderwijk and Janssen 2014). Meanwhile, systematic inquiry on how the government will engage and collaborate with other entities such as citizens is still limited (Chan 2013; Kassen 2013). While in the open data initiatives, government agencies have to actively interact with the citizens because they are an open system, how the citizens can give feedback to such an initiative is crucially important (Janssen et al. 2012; Sayogo et al. 2014). However, this citizen feedback mechanism is non-existent. Furthermore, this citizen feedback mechanism will be a key to building better mechanisms for the government to respond to their environment in real time and in a timely manner.

Using the case of the city of Chicago open data initiative, Kassen (2013) suggests that citizen-sourcing platforms transform the way government collaborate with its citizens in an open data initiatives. As shown in Figure 1, government might put their best effort in realizing open data initiative benefits such as providing innovative environment in order to attract more active citizens' participation (for example by providing Application Programming Interface (API) or by creating apps challenge competitions) (Chan 2013). However, benefits realization of the open data initiative does not depend on this government effort per se, but it is also influenced by the citizens' active involvement through the independent citizen-sourcing platforms. Citizen-sourcing adopts the extant widely used term crowdsourcing, which refers to the use of technologies to harness the collective effort and wisdom from the crowd for organizational innovation and/or problem solving (Nguyen 2013; Saxton 2013). In this context, citizen-sourcing platforms refer to various application development projects driven by open data initiatives that utilize open data.
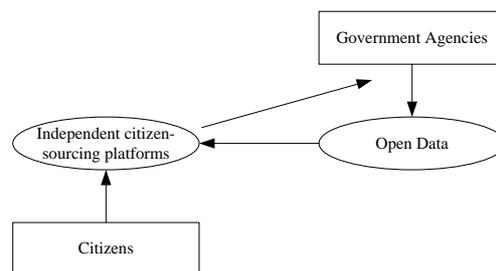
Figure 1: Symbiosis of Open Data and Citizen-sourcing Platforms (Kassen 2003)

THE CONTEXT: 2014 INDONESIA PRESIDENTIAL ELECTION

Indonesia has two elections in 2014: parliamentary and presidential election. The two elections were organized by the General Election Commission (KPU). While the parliamentary election was held on 9 April 2014, the presidential election was held three months later on 9 July 2014. In the presidential election, citizens cast their vote for a presidential candidate pair: president and a vice president. In Indonesia, the KPU is a state auxiliary body which means that it is not part of the government but is a quasi-governmental organization that provides public services and interacts with the citizens in almost the same way with government organizations.

Importantly, the KPU holds crucially important roles in the democratization process of the country through honest and fair election processes.

Table 2. Forms Used in Different Level of Plenary Meeting and Tabulation Schedule

Form	Level	Tabulation Schedule
C1	Polling Place	9 July 2014
D1	Sub-District	10-12 July 2014
DA1	District	13-15 July 2014
DB1	City/Regency	16-17 July 2014
DC1	Province	18-19 July 2014
DD1	National	20-22 July 2014

Using the manual voting process, a polling place in Indonesia serves the maximum of 800 voters in the Election Day. Each vote was then tabulated at polling place, sub-district, district, city/regency, province and national levels. With 33 provinces and 497 cities/regencies, there are 478,828 polling places throughout the country (including overseas polling places). At each level, a different form is used as shown in Table 2. C1 Form is used to tabulate all tallies at the polling place. Based on the C1 Forms, the Election Committee at the sub-district level then held an open plenary meeting. Decision on all the disputes in the polling place level was taken at this level. The plenary meeting results tabulation at the sub-district level is presented in D1 Form. Based on the D1 Form, the Election Committee at the district level held an open plenary meeting to make necessary decisions on all disputes at the sub-district level. The result of the open plenary meeting at the district level is shown on the DA1 Form. Similar processes happen at the higher level using different forms. The DB1 Form is used at the city/regency level, the DC1 Form is used at the province level and finally DD1 Form is used at the national level. This manual process requires a significantly long lead time for a single tally from the polling place to reach the national tabulation. Importantly, however, according to the previous elections, it also opens up the fraudulent voting counts. Table 2 also presents the schedule for the tabulation process in this presidential election.

RESEARCH METHODOLOGY

This research attempts to reduce the gap in the literature on the social media roles in the context of open data initiative. We raised our central research questions: *How does social media play its roles in an open data initiative*? To answer this research question, we employed case study research as the research methodology. Case study research is suitable for exploratory research (Benbasat et al. 1987) and appropriate to answer "how" or "why" research question (Eisenhardt 1989). By employing case study research, researchers are able to explain or clarify a particular situation and to get a clear understanding of a certain phenomenon (Eisenhardt 1989; Yin 2003). We select the open data of the 2014 Indonesia presidential election voting results as the context of our case study. Indonesia is one of the founding nations of the Open Government Partnership initiatives and Indonesia has one of the world's largest number of active social media users (Semiocast 2012; Wikipedia 2013).

In order to answer the research question, we first observed the open data initiative by the KPU. Second, we observed citizens' response to this initiative, especially responses that allow citizens to collectively participate in digitizing or reviewing the scanned C1 Form or reformatting the DA1, DB1 and DC1 Forms. We selected 10 independent citizen-sourcing websites from a list produced by a citizens' online forum that dedicated to monitor the tabulation process and observe their social media use. Third, we observed the citizens-initiated use of Tumblr in order to report the abnormal data published by the KPU. Tumblr is Yahoo own microblog site that allows its users to post multimedia files and presented in a blog style (Wikipedia 2014). Specifically, we monitored http://c1yanganeh.tumblr.com ("c1yanganeh" literally means "anomalous C1 Form") by employing a crawler to download all the data posted by the website. This website is one of the 10 websites that showed citizens' response on the KPU open data initiatives. The http://c1yanganeh.tumblr.com is officially endorsed and referred by the KPU. We also observed the Facebook page created by the KPU, which is dedicated to discuss all the technical reports generated during this presidential election. The observation period starts from a day after the voting day to the official national result announcement, namely, from 10 July to 22 July 2014.

FINDINGS

The KPU's Open Data Initiative

In the past, parliamentary or presidential elections in Indonesia have been accused as being prone to fraud

(Sukma 2009). One of the plausible causes of the fraud is largely due to their weak internal control systems, including too many levels in the tabulation process. Even though the KPU is mandated to open plenary meetings at each level, the manual tabulation process certainly increases the risks of fraud. Therefore, in this election, there are two initiatives undertaken by the KPU to avoid the fraud: publishing the scanned C1 Form and providing the result of DA1, DB1 and DC1 Forms.
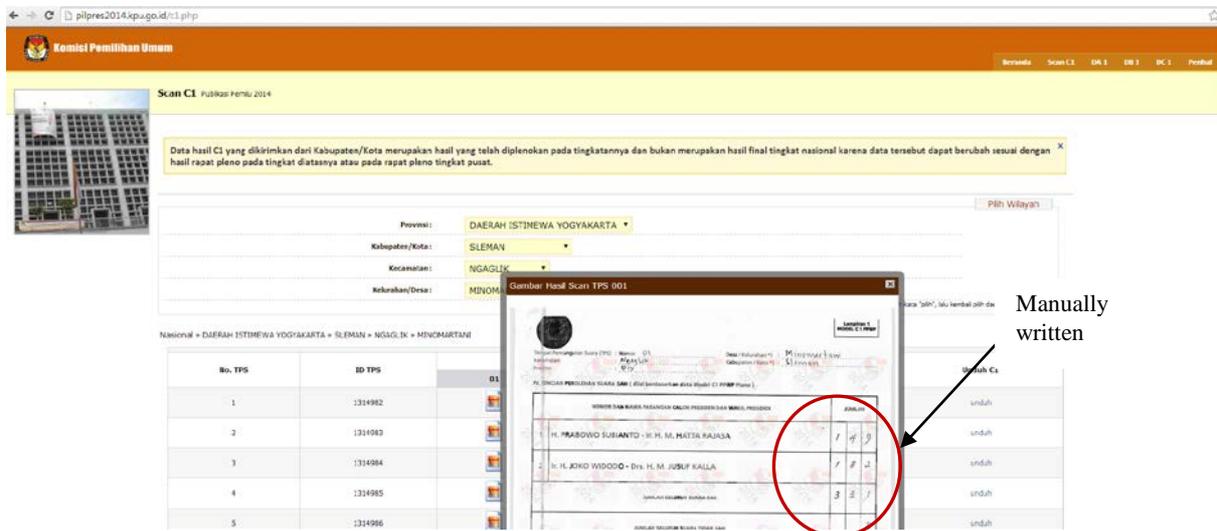

Figure 2: Scanned C1 Form Published in the KPU's Website

In the first initiative, the KPU published their primary source data by providing the scanned C1 Forms at their website. The scanning process was carried out by the Election Committee at the city/regency level. The C1 Form consists of four pages which contain the number of votes manually written for each candidate on the fourth page. For better security, the KPU used a specific paper with hologram that would be clearly shown in the scanned document, as shown in Figure 2. On the fourth page, it displayed all the polling place's Committee members' name, election witnesses from the two candidates' name and their signatures. All of the scanned C1 Forms were of jpg file type without metadata explaining the content of the image.

In the second initiative, the KPU also published the tabulation result using the DA1, DB1 and DC1 Forms. Since the DA1, DB1 and DC1 Forms showed the results of open plenary meeting at the District, City/Regency and Province level, respectively, the publication can be done only after the process at each level was completed according to the schedule listed in Table 2. In contrast to the scanned C1 Form, all of the DA1, DB1 and DC1 Forms were displayed in html file that would allow further extraction process if needed. The two Forms, the D1 Form for the sub-district level and the DD1 Form for the national level were not displayed in the KPU's website menu. Sunlight Foundation (2010) introduced 10 principles of the open data: (1) Completeness, (2) Primacy, (3) Timeliness, (4) Ease of Physical and Electronic Access, (5) Machine readability, (6) Non-discrimination, (7) Use of Commonly owned Standards, (8) Licensing, (9) Permanence and (10) Usage Cost. While the data in the second initiative comply with these 10 principles, the first initiative does not comply with the fifth principle. The jpg file type is hard for machine to automatically read the result. Furthermore, the manually hand writing in the scanned C1 Form needs further effort to recognize the pattern.

Independent Citizen-Sourcing Applications

In response to the KPU's initiative that published the C1, DA1, DB1 and DC1 Forms for voting transparency, at least there are three streams of independent citizen-sourcing applications/websites launched by citizens. The first stream is the action involving the citizens to digitize the published scanned C1 Forms. The second stream is dealing with the DA1, DB1 and DC1 Forms that have been digitally provided by the KPU. The third stream is specifically dedicated to carefully inspect and then report any anomaly among the scanned C1 Forms. A brief description of these websites is shown in Table 3.

Regarding the first stream, there are several initiatives: http://www.kawalpemilu.org/, http://kawal-suara.appspot.com/, http://solusirfid.com/pemiluc1/ and http://pemilu-id.appspot.com/. The initiators of these initiatives created websites and asked the citizens to key in the result written on the scanned C1 Forms. These four sites downloaded the scanned C1 Forms from the KPU's website and showing them in a snippet with textboxes for the citizens to key in the election result. Of these initiatives in the first stream, three of them (http://www.kawalpemilu.org/, http://kawal-suara.appspot.com/, http://solusirfid.com/pemiluc1/) used social media for recruitment and interaction with the citizens.

Table 3. The Independent Citizen-Sourcing Websites

Website	C1	DA1	DB1	DC1	Social Media
http://www.kawalpemilu.org/	√	√	√	√	Facebook, Twitter
http://kawal-suara.appspot.com/	√			√	Facebook
http:// solusirfid.com/pemiluc1/	√	√	√		Kaskus (Forum)
http://pemilu-id.appspot.com/	√				Unknown
http://realcount.herokuapp.com/	√				Facebook, Twitter, Google+
http://rekapda1.herokuapp.com/	√	√	√	√	Unknown
http://caturan.com/	√	√			Unknown
http://cross-check.herokuapp.com/		√	√	√	Unknown
http://c1yanganeh.tumblr.com/	√				Tumblr
http://kawalpilpres.appspot.com/	√				Unknown

The http://www.kawalpemilu.org/ ("kawalpemilu" is literally translated as "guarding the election") was initiated by Ainun Najib, former mathematic Olympiad champion and now working as a senior IT consultant in Singapore. By involving several of his colleagues, he began to work on the project on 10 July 2014 and finished within two days (Arif 2014). This initiative receives the most spotlights from the mass media. Their simple look-up table provided C1 tabulation that showed the current result at the province level. Each province name had a link that could be traced into regency/city, district, sub-district and polling place results. All the C1 tabulation has been done by volunteers by digitizing the results of each polling place using a simple interface as shown in Figure 3 below. Later, it also provided DA1, DB1 and DC1 tabulation for comparison with their C1 tabulation results. The data is synchronized from the KPU server. To crowdsource the volunteer, they created a Facebook page on 14 July 2014. Later on, they also use Twitter (@kawalpemilu2014). On 15 July 2014, this website finished more than 200,000 polling places' primary source data (Kawal Pemilu 2014) and finally reached 469,347 (or 97.91% of the total polling places) on 22 July 2014.
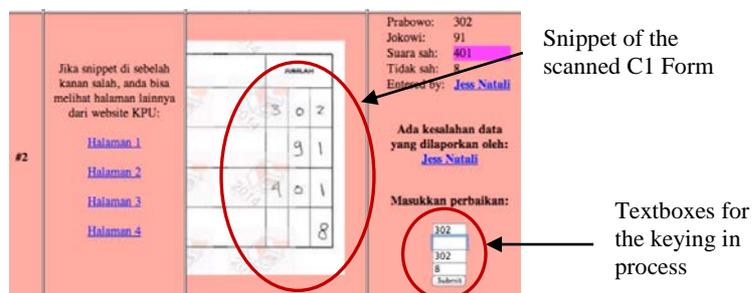

Figure 3: Sample of Keying in Screen for the scanned C1 Form (Kawal Pemilu 2014)

The http://kawal-suara.appspot.com/ ("kawal-suara" is literally translated as "guarding the vote") was initiated by Reza Lesmana, an IT expert who works in the telecommunication industry. The first post announcing the existence of this site was made on 12 July 2014 through his Facebook account. On the same day, he also made a dedicated Facebook page, https://www.facebook.com/CrowdSourcedCount. This site provided volunteers two roles: data entry and data entry verification. For the data entry, volunteers were asked to digitize the scanned C1 Forms that were randomly selected. Similarly, for the data entry verification, volunteers were asked to check randomly selected Forms from the data entry pool. This site also provided their top contributors and their newest database result. On 15 July 2014, this crowdsourcing effort has reached 100,000 polling places and finally completed 288,081 polling places by 22 July 2014 (or 57.19% of the total polling places) (Lesmana 2014).

The http://solusirfid.com/pemilu1/ not only provided data entry menu, but also presented some simple reports, such as top contributors, searching for specific area's voting results and graphs. Slightly different from the two applications above, the http://solusirfid.com/pemiluc1/ used a web-based forum to attract citizens to participate. The http://solusirfid.com/pemiluc1/ uses Kaskus that made a self claim as the largest Indonesian online community. The thread in the forum attracted almost 1,500 postings and viewed more than 56,000 times as of 22 July 2014. The first post in this thread was created by a user name "ryannining" to contain an invitation to participate to key in the C1 result. In this crowdsourcing invitation, the user provided the link for the source code of the program he/she used. That first post was made at 13:14 on 11 July 2014. Amazingly, within two hours, the

keying in process has reached more than 1018 polling places' data (Ryannining 2014). As of 22 July 2014, this initiative attracted 3,358 contributors and finished 273,875 polling places (or 57.19%).

Meanwhile, the http://pemilu-id.appspot.com/ has finished 96.74% of the total polling place as of 22 July 2014 but this site did not provide further information on how they crowdsourced their volunteers through social media use. The http://realcount.herokuapp.com/ that was initiated by Pahlevi Fikri Auliya has stopped to operate earlier on 13 July 2014 for unknown reasons. However this website has finished digitizing 14 thousands scanned C1 Forms and attracted more than 400 users. They allow users to share this website through Twitter, Facebook and Google+.

The second stream of the citizens' actions is dealing with the digital data of the DA1, DB1 and DC1 Forms from the KPU server. These two websites http://rekapda1.herokuapp.com/ and http://caturan.com/ were dedicated to extract the data from the KPU's website. They create tools that automatically download the DA1, DB1 and DC1 information from the KPU's website, reformat the information in a more readable presentation and finally publish the results in their websites. Later, these two websites imported the C1 results from http://www.kawalpemilu.org/ to provide comparisons of the results. In this second stream, only http://realcount.herokuapp.com/ used the social media feature. However, they did not actively use it. They only provided a social media plugins for their visitor to share their website.

The third stream of the citizens' innovative actions was to inspect the scanned C1 Forms and check whether any anomaly existed. The http://kawalpilpres.appspot.com/ was dedicated to only check whether the C1 Form was legitimate for further processing or not. This website randomly showed a scanned C1 form and asks their volunteers to check whether any anomaly existed. They provide three categories for the anomaly: erroneous sum, no election witness's signature and unclear scanned form. Up to 22 July 2014, there are 3,818 Forms being inspected and of these Forms, 315 anomalous Forms have been reported. The http://c1yanganeh.tumblr.com/ was created for citizens to upload the anomalous scanned C1 Forms. In this third stream, only the http://c1yanganeh.tumblr.com/ used social media. In fact, they used social media as their platform. Further discussion on this initiative will be presented in the following section.

Collaboration on the "Anomalous" Scanned C1 Form

As we mentioned in the previous section, there were at least two dedicated websites initiated by citizens to collectively report the anomalous scanned C1 forms. While the http://kawalpilpres.appspot.com/ did not open the collection of their anomalous reported scanned C1 form, the other site, http://c1yanganeh.tumblr.com/ was allowing citizens to explore further on their collection. By showing in a blog style, visitors are able to browse all the reported scanned C1 Forms. To report an anomalous scanned C1 Form, citizens could send through their Gmail account c1yanganeh@gmail.com. In their disclaimer they stated clearly that they would not report the anomalous scanned C1 Form to the KPU. However, this website was officially referred by the KPU through the KPU's circular 1395/KPU/VII/2014. The official circular was released on 13 July 2014 and addressed to all the election committees at the province and city/regency level to use the http://c1yanganeh.tumblr.com/ as their reference.

Running a crawler to download all the data from http://c1yanganeh.tumblr.com/, we found 125 reports posted during the observation period. Putting all the 125 reports' timestamp in time series, we found that the sites started to actively post their collections on 11 July 2014 or two days prior the KPU's official circular. It then peaked on 14 July 2014, with 69 posts and 20 posts on the following day. After that, there was no post in the websites until the end of the observation period as shown in Figure 4 (left). Of these 125 reports, we classified the type of the reports based on the description given on each post. By observing the description of each post, we found that there were 7 types of reports: erroneous sum, empty data, witness' failure to sign the Form, wrong uploaded Form, modified Form, unclear Form and clarification. The last type of report was actually a confirmation rather than a report.
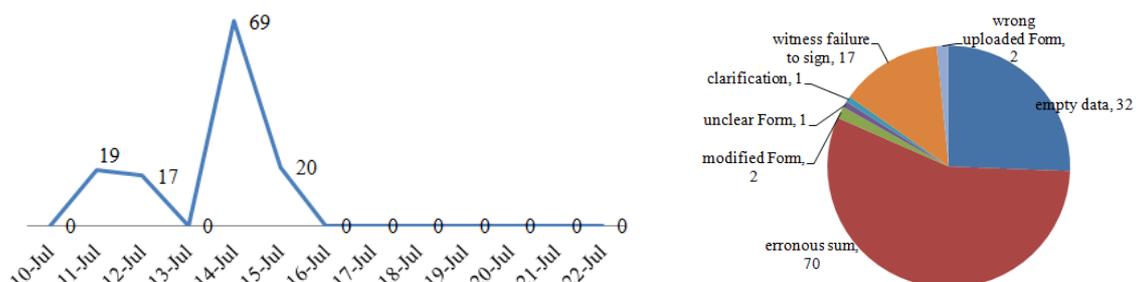

Figure 4: Timeline (left) and Error Classification (right) of the Reports Posted in http://c1yanganeh.tumblr.com

The erroneous sum report usually happens when the wrong summation written in the scanned C1 Form. Though it is a simple basic math, this kind of error dominated the reports. The empty data is for the scanned C1 Form that had no result written on it. The next type of error (witness failure to sign) occurs when at least one of the election witnesses failed to give their signature on the scanned C1 Form. The next type of error (wrong uploaded Form) happens when the Election Committee uploaded the wrong page of the C1 Form. As discussed earlier, the C1 Form has 4 pages. Uploading all the four pages in the wrong order is identified as an error. Citizens also found modified Forms. This type of error happens when the manually written election result is modified without any signature on the change made. Last, the unclear Form is a bad quality image that cannot be read which was produced during the scanning process. The result of the classification is that the erroneous sum scores the highest number, with 70 reports as shown in Figure 4 above (right). It is followed by: the empty data (32 reports), witness's unsigned Form (17 reports), wrong uploaded Form (2 reports), modified Form (2 reports), unclear Form (1 report) and 1 clarification from the KPU.

Figure 5: Sample of Error Reported in Tumblr (left) and It's Correction Uploaded in the KPU' Facebook Page (right)

To uncover the KPU's response on the error found by the citizens, we observed a new Facebook page created by the KPU that was dedicated to discuss all the technical errors in publishing the scanned C1 Forms. The Facebook page's name is HelpDeskKPU, which was created on 11 July 2014. It is apart from the existing KPU's Facebook account (KPU 2014). Using this Facebook page, the KPU actively posted clarifications on the reported anomalous scanned C1 Forms. For example, on 14 July 2014 there was a report on the erroneous sum in Tumblr Figure 5 (left). It was the scanned C1 Form from the polling place number 26, Argorejo, Sedayu, Bantul, Special Area of Yogyakarta. The simple basic math should be 104+133 = 237, but the polling place Committee wrote 137 instead of 237. Two days later, on 16 July 2014, the KPU posted an answer on their Facebook page explaining that the error has been fixed at the higher level of the Election Committee's open plenary meeting and posted Figure 5 (right) as the clarification. In the clarification, there was the sub-district Election Committee's signature showing that the modification has been approved.

DISCUSSION

Our main research question was: *How does social media play its roles in an open data initiative*? We answered this question by observing the KPU's open data initiative during the 2014 Indonesia presidential election voting counts. While there are open data principles referred by best open data practices in developed countries (Open Government Working Group 2007; Sunlight Foundation 2010), developing countries may face challenge in complying with some of these high ideal principles (Janssen et al. 2012; Sayogo et al. 2014; Zuiderwijk and Janssen 2014). In this paper we found that the KPU's open data initiative did not comply with at least one of the open data principles: machine readability. Nonetheless, this did not present a barrier for the citizens in positively responding to this open government data initiative. The networked citizens responded very rapidly by establishing independent citizen-sourcing applications which are typically found in the advanced open data initiatives in developed countries (Chan 2013; Kassen 2013). However, our observation also showed that these independent citizen-sourcing applications were highly dependent on the capability of social media in attracting active participation of the networked citizens. Our other finding showed that by using multiple social media platforms, government and citizens were actively collaborating to identify the anomalous scanned C1 Forms. This finding is consistent with prior research on the use of social media to promote collaboration between government and citizens (Bertot et al. 2012; Bonsón et al. 2012).

Another finding in this study was the use of Platform as a Service (PaaS) such as Heroku and appspot. Heroku and appspot are PaaSs that provide several programming languages in supporting their users to easily build and run their application. While appspot.com is Google owned cloud computing services that allow its users to build and run on Google's infrastructure, heroku is owned by salesforce.com. We found that these two PaaSs might have significant contributions to the ability of the citizens to quickly develop those 9 citizen-led applications (except the one created in Tumblr), however further investigations are needed to uncover the role of these PaaSs in the open government data initiatives.
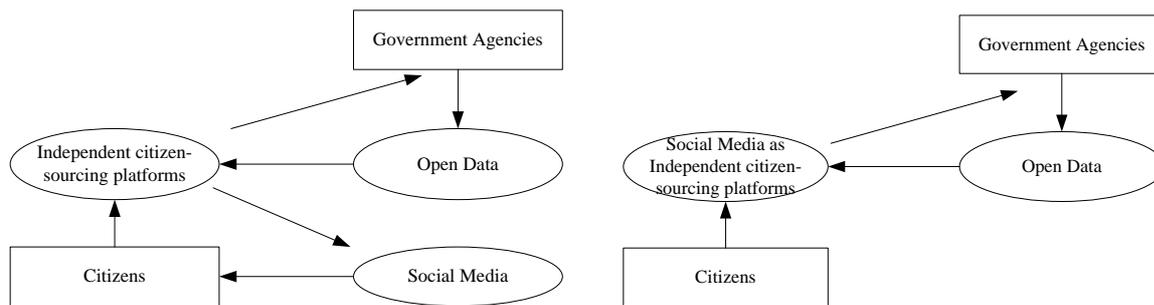
Figure 6: Social Media as Enabler (left) and Social Media as Citizen-Sourcing Platforms (right), adapted from Kassen (2013)

These discussions led us to our main goal of reducing the gap in the literature on roles of social media in influencing the outcome of open data initiatives. We propose that there are at least two roles of social media in the open data initiatives as shown in the Figure 6 above. This Figure 6 is intended to indicate how we extend the framework proposed by Kassen (2013) discussed in our Literature Review section earlier in this paper.

First, social media is *an enabler* of the independent citizen-sourcing platforms in the open data initiatives. This is supported by at least 3 of the 10 citizen-sourcing applications discussed in the previous section. In this enabling role, social media interacts indirectly with the government's open data initiative through the citizen-sourcing applications. In this enabling role, social media creates a safe and secure environment for the independent citizen-sourcing application to take roots and grow. In this enabling role, social media also magnifies the efficacy of crowdsourcing volunteer workforce in comparison with the traditional way of hiring temporary workers for wages. Social media also provides power for the citizen-sourcing applications. These three applications embedded and enacted on the social media platforms attracted the attention of mass media which reported these citizen-sourcing application initiatives as an interesting news (Bachelard 2014; Kwok 2014). They also symbolically represent the strong demand of the citizens to the government for better cultural transparency (Bertot et al. 2012).

The second role of the social media in the open data initiative is serving as the platform for independent citizen-sourcing applications. This is supported by our finding in the Tumblr use to report any anomalous scanned C1 Forms. Most of the social media are now providing platforms for the user to create applications. Most of the social media are also based on the cloud computing ecosystem that allows scalable application development. Thus, social media itself can become an integrative meta-platform for coordinating and communicating across the independent citizen-sourcing platforms.

CONCLUSION

In this empirical research we addressed our central research question on the social media roles in the open data initiatives. We examined the roles of social media on the 10 citizen-sourcing initiatives in responding the open data initiative during the 2014 Indonesia Presidential Election voting results. In extending the Kasen's (2013) framework, our results showed that social media can be both *an enabler* and *a platform* of the citizen-sourcing applications in the open data initiatives. As *an enabler* social media provides environment for the citizen-sourcing applications to grow and conduct citizens' crowdsourcing. In the second role, social media provides *platform* for the citizens to directly create citizens-led applications.

Our findings have demonstrated a promising way to reduce the gap we have found in the literature, by our extension to the existing framework (Kasen's 2013). They have some important implications for the first mover countries in leveraging social media to benefit from their open data initiatives. However, our research has inherent limitations because we only focused on a single open data initiative in Indonesia. Our future research directions include an application of a new extended framework we proposed in this paper to other country settings and also identifying factors influencing the citizens to actively participating in the independent citizen-sourcing initiatives.

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