STUDY ON THE USE OF DATA MINING TECHNOLOGY FOR ELECTION CAMPAIGNS IN INDONESIA

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Abstract: Indonesia adheres to democracy with a presidential government format. From the beginning of the reform era in Indonesia, the system of electing government representatives in the realm of council members, regional heads, and heads of state was carried out by looking for direct elections. Direct elections are carried out with several stages starting from registration, campaigning, elections, to the decision to recapitulate the winner's vote. One of the ways that candidates for election participants do is to campaign massively to the public. This campaign is expected to introduce the candidate to be the top choice of the community. The biggest challenge of this massive campaign is how much it costs compared to the reach of socialization to the community. Campaigns in conventional forms such as banners and social assistance do not necessarily make the election participants win an election, especially when the campaign funds have been enlarged to exceed the competitor who won the election. With the existence of social media, which is developing quite rapidly today such as Facebook, Instagram, Twitter (x), TikTok, and so on, election participants have used social media as an alternative and even the main campaign media. The next challenge is how the use of social media can produce significant results in the campaign of election participants. One of the sciences in the world of technology is data mining. Data mining helps in processing data to provide decision references that are in accordance with the sampling conditions of the conditions taken from the data. The purpose of this journal is about the utilization of data mining technology in helping election campaigns with social media to the factors involved in this in the current era of Indonesian democracy.
Keyword: Election, Indonesia, social media, data mining.

INTRODUCTION

Indonesia is the third largest democracy in the world, after the United States and India. Although the pillars of the democratic system in this country have been and continue to develop well, the nature of democracy to produce the best leaders at all levels still needs attention. The Indonesian state is referred to as a democratic state (people's sovereignty) as affirmed in Article 1 paragraph (2) which reads that sovereignty is in the hands of the people and is exercised according to the Constitution. In addition, the proclamation of Indonesian independence on August 17, 1945, is one proof that Indonesia is a democratic country. The implementation of the people's sovereignty is the implementation of direct elections that are chosen by the community.

Based on data from the Central Statistics Agency (BPS), Indonesia's population is projected to reach 275.77 million in 2022. This number increased by 1.13% compared to last year's 272.68 million. If we look back, the population in the country was 255.58 million in mid-2015. The number then rose to 258.49 million in mid-2016. Meanwhile, the number of permanent voters in domestic elections is 190,779,969 voters and the number of voters abroad totals 2,086,285 voters.

The large number of population and permanent voters who vote in each election in Indonesia causes the large campaign costs for each election participant, be it individuals, parties, or presidential / vice presidential candidates to the public. According to data from the Center for Macroeconomic Policy of the Fiscal Policy Agency (BKF) of the Ministry of Finance, using the 2019 Election permanent candidate list (DCT) to make assumptions with details, namely 580 DPR seats, 2,372 provincial DPRDs, and 17,510 district / city DPRDs. From this data, each DPR seat is contested by around 8,037 candidates. Meanwhile, the total number of

candidates competing for the first and second level DPRD seats touched 258,631 people in the 2019 elections. From here, it is analyzed that the average expenditure of campaign costs is billions and even tens of billions of rupiahs. The amount of these costs is the capital of election participants which is usually used for campaign costs such as preparing attributes (t-shirts, banners, advertisements, billboards) and logistics. The goal is none other than to increase the branding of the election participants.

METHODOLOGY

This research journal focuses on case studies of election campaigns using social media supported by data mining technology. The main focus of the method used in this journal lies on how data mining can be used in determining campaign content decisions for election participants. The research method in this journal is also related to the literature study or literature review described in this journal as well. When referring to the basic stages of data mining, the process carried out in this journal method is described as follows:

Data sources

At this stage, we determine the source of social media that will be used as a reference or reference that is popular in Indonesian society in daily life. Referring to data from a research, the sources of social media data that are popular in Indonesia include:
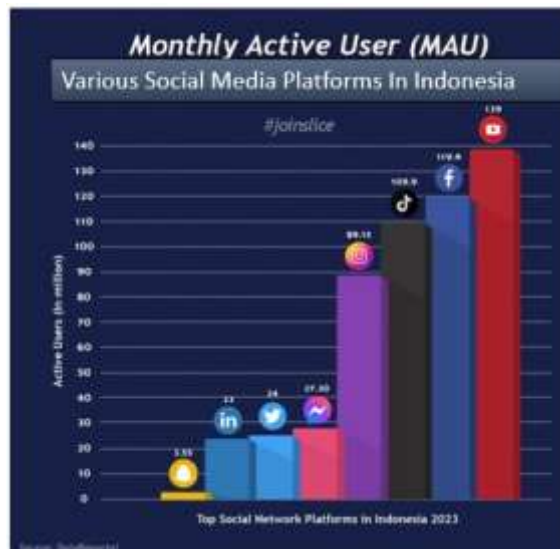

Figure 1. Top social media in Indonesia 2023

Data Exploration

In the data exploration stage, we determine the platform, format, and data retrieval connection that will be used in data mining later from the referenced social media. As a study in this journal, we specify the following:
1. Platform: Website and Mobile (Android/ iOS)
2. Format: JSON, URL, Keyword, Hashtag, Metadata
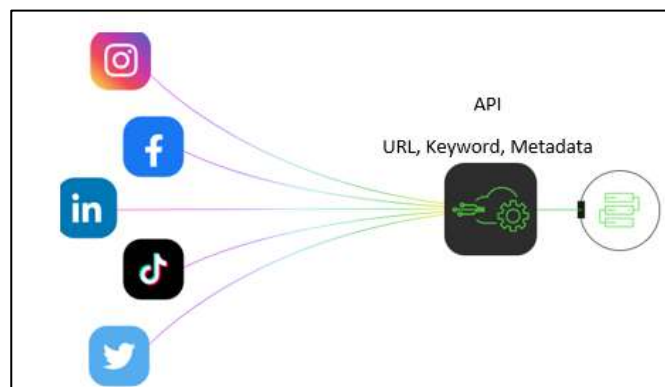3. Connection: API (Application Programming Interface)

Figure 2. Data Exploration via Sample Social Media API Flow

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Modeling

The next stage in the data mining process is the selection of the model that will be used in mining. An effective model that is often used by various political consultants or pollsters is Data Scrapping. Data scraping, or in Indonesian known as data collection, is the process of automatic extraction of information or data from various sources on the internet. This method allows users to collect large amounts of data quickly and efficiently from various online social media.
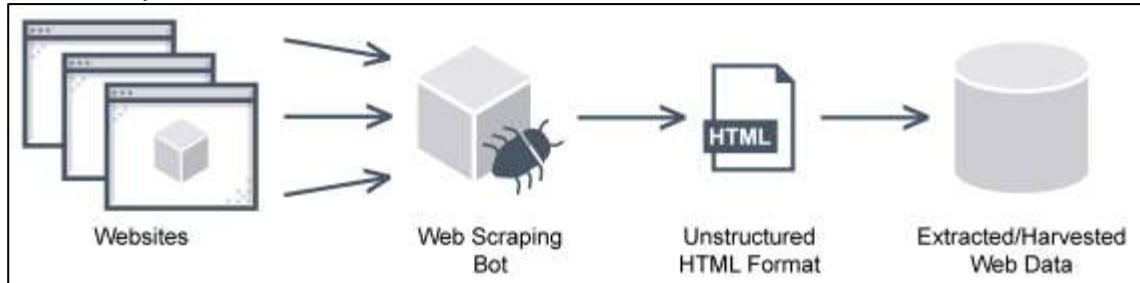

Figure 3. Sample Flow of Data Scraping on Website

Data scraping can be used for various purposes, such as conducting market research, monitoring product prices, collecting contact data, or analyzing trends and patterns. Using scraping techniques, users can retrieve information such as text, images, tables, reviews, or other content from web pages and store it in a usable format, such as an Excel file or database.

Deploying Models

The final stage of data mining processing is to process the data extracted from the source with algorithms commonly used in decision making. The outstanding algorithms in the case study of data mining utilization with data mining techniques: association, classification, clustering, and regression. Some examples of algorithms that can be used such as naïve bayes algorithm, NLP algorithm, K-Means algorithm which does not rule out the possibility that we can use other algorithms.
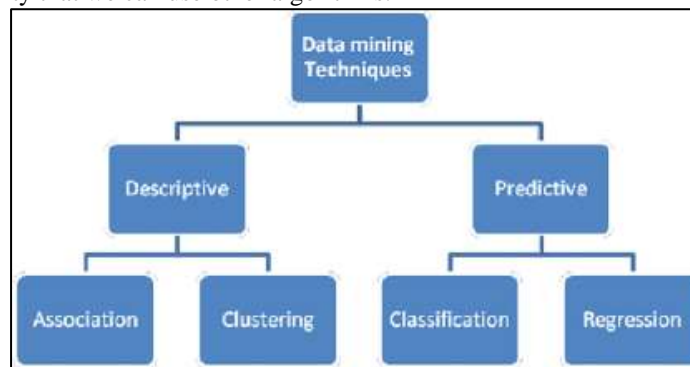

Figure 4. Data Mining Techniques

RESULTS AND DISCUSSION

In this journal, once we know about the methodology that will be used, we need to simply describe how the methodology works. The flow design outlined in the process description can explain a comprehensive analysis of the utilization of data mining technology in election campaigns in Indonesia. The flow design is described as follows:
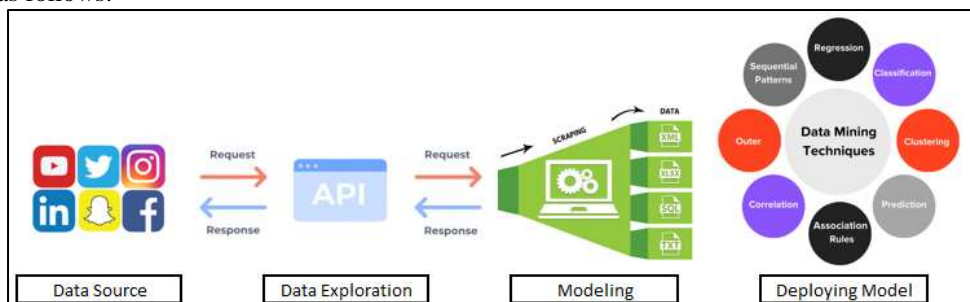

Figure 5. Data Mining Simple Flow for Social Media Campaign

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The flow can describe all stages of fulfilling the methodology that correlates with the referenced literature study. Compliance needs to be determined at the beginning as readiness in the design of utilizing data mining technology to analyze sentiment, both positive and negative, that develops from social media that is always updated at any time so that election participants can determine their campaign content online in the context of branding to their victory itself. The simple flow shown in the picture above can be made into technical details so that we can learn the real workings of data mining itself along with samples of each stage summarized in the picture below:
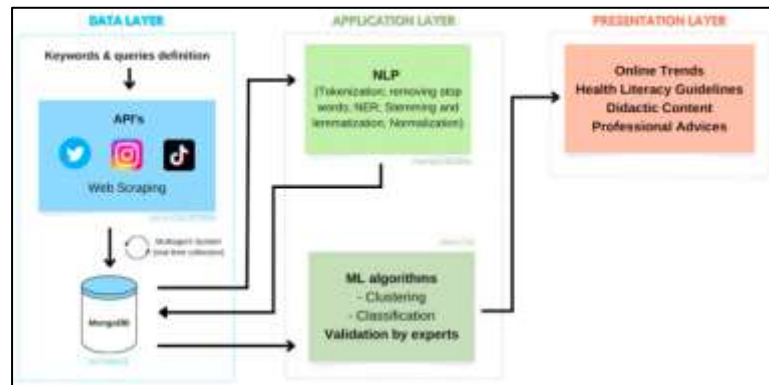

Figure 6. Social Media Analysis

Case Study Results

After listening to the explanation of the simple design of the flow of data mining utilization in social media campaigns for election participants, here we will describe a sample of several case studies that occurred during the election event both at the regional and national levels. The case study samples used are a form of learning results that occur to election participants that correlate with their campaign content or materials on social media during the campaign until the general election directly occurs. The following is a sample case study with the election results described in the data table below:

Table 1. Data Sample of Election Campaign via Social Media

Election Participant	Election Type	Social Media	Data Mining Content	Election Result
Joko Widodo	2012 - Jakarta Governor	Twitter, Facebook	Blusukan, Kemeja Kotak-Kotak	Won - 53,82%
Ganjar Pranowo	2013 - Central Java Governor	Twitter	Mboten Korupsi, Mboten Ngapusi	Won - 48,82%
Joko Widodo	2014 - Indonesia President	Facebook	Jokowi-JK Presiden Kita	Won - 53,15%
Ridwan Kamil	2018 - West Java Governor	Instagram	Rindu Jabar Juara	Won - 33,88%
Ganjar Pranowo	2018 - Central Java Governor	Instagram	Tuanku ya Rakyat, Gubernur Cuma mandat	Won - 58,78%
Joko Widodo	2019 - Indonesia President	Instagram	Kemeja Putih, Indonesia Maju	Won - 55.50%

In the sample data contained in the table, we can outline the following explanation:
1. **2012 - Jakarta Governor Election - Joko Widodo**
   In the 2012 Jakarta governor election, Joko Widodo as a challenger candidate used social media in branding his profile. It was noted in a cited research journal that Joko Widodo used twitter media in his campaign rather than banners or billboards. Taglines posted on twitter used the words "blusukan" and "plaid shirt". The massive tagline on twitter made Joko Widodo get a share of awareness of 52.6%. Public awareness of Joko Widodo helped his victory with a vote recapitulation of 53.82% which was almost in line with his awareness.

2. **2013 – Central Java Governor Election – Ganjar Pranowo**
   Ganjar Pranowo uses more or less the same social media used by his party colleague who won the Jakarta gubernatorial election, Joko Widodo. Ganjar Pranowo as a challenger candidate for Central Java

governor always posts photos of his activities accompanied by Ganjar's branding tagline "Mboten Korupsi, Mboten Ngapusi" or translated as anti-corruption people. The campaign on social media was carried out by Ganjar Pranowo considering the vast area of Central Java which is +-34 thousand kilometers and also permanent voters above 34 million people spread to remote villages. This method proved to be effective with Ganjar's victory of >48% according to the 2013 KPU decree.

3. **2014 – President Election – Joko Widodo**
A political marketing study outlined in a journal explained that Joko Widodo as one of the contestants of the 2014 presidential candidate was assisted by his winning strategy through social media Facebook. Joko Widodo used Facebook because of its national campaign coverage. In the 2014 study, Facebook was a very popular social media in Indonesian society. Joko Widodo who used the tagline "Jokowi-JK President Kita" helped the presidential election win according to the KPU stipulation of >53%.

4. **2018 – West Java Governor Election – Ridwan Kamil**
Social media helped in Ridwan Kamil's campaign in the 2018 gubernatorial election. In a research journal entitled "The Role of Social Media in the Winning of Ridwan Kamil in the 2018 West Java Regional Election" it is explained that Ridwan Kamil actively used Instagram means in socializing his public image accompanied by the campaign promotion tagline "Rindu Jabar Juara" so that this helped his victory with a percentage of >33%.

5. **2018 – Central Java Governor Election – Ganjar Pranowo**
After winning the 2013 Central Java gubernatorial election, Ganjar Pranowo again used social media in his campaign. In 2018, Ganjar used the tagline "Tuanku ya Rakyat, Governor Cuma mandate" which became one of Ganjar's appeals that positioned himself as a servant to the people in Central Java. The massive campaign conducted both during his reign as incumbent governor and also the campaign period from the KPU increased his victory to >58% or up 10% from the 2013 election.

6. **2019 – President Election – Joko Widodo**
The use of social media in 2019 was carried out again by Joko Widodo in the presidential election. In a study, Joko Widodo used positioning himself with a white shirt. Posting on social media with a white shirt is an active campaign about his positive image as a clean and sincere person in taking care of the country. In addition, the gesture of a folded white shirt seeks to create an image of him as a hard worker. With the vision of his tagline "Indonesia Maju" on social media, Joko Widodo again won the presidential election for the second term with a victory rate of >55%.

CONCLUSION

From the explanation of the journal at the beginning to the results, it shows that the study conducted can be useful for similar research, especially in terms of intellectuals and technology. The background of the problems experienced by election participants in conducting conventional campaign activities shows that non-digital campaigns centered on billboards, banners, t-shirts, and so on are at great risk with political costs for each individual who wants to nominate himself in an election both at the regional and national levels. Large costs sometimes do not produce linear output to the percentage of victory for the election participants.

Social media is an inevitable alternative for election participants. Indonesian people are increasingly fond of surfing the internet, causing a very significant increase in social media itself which is used as a reference media for the community in finding information, news, and community sentiment that is currently being discussed. From some of the case study results presented in this journal, it is clear that every election participant who uses social media has a high popularity ratio and has an impact on their electability in the general election competition that they participate in. The content or tagline used is certainly processed by each success team of the election participants with the hope that they can find out how effective the keywords they post on social media are welcomed by the sentiment of the public.

The utilization of data mining can support the processing of sentiment data from social media. Data mining from taking directly through real mechanisms with APIs that are provided by each social media. From the API, the data will be retrieved by scraping data and forwarded by the system to be further processed with decision support algorithms such as naïve bayes, NLP, or other algorithms that are suitable choices for each election participant in capturing data related to their campaign on social media. The final conclusion shows that from several case studies, election participants who use social media have a fairly high winning ratio by paying attention to the sentiment of the tagline or content they campaign on social media.

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