# Prediction of Indonesian presidential candidates in 2024 using sentiment analysis and text search on Twitter

Tawakkal Baharuddin [a,1,*], Zuly Qodir [a,2], Hasse Jubba [a,3], Achmad Nurmandi [a,4]

[a] Political Islam-Political Science, Universitas Muhammadiyah Yogyakarta, JL. Brawijaya, Kasihan, Bantul, Yogyakarta 55183, Indonesia
[1] tawakkal.b.pasca18@mail.umy.ac.id *; [2] zuliqodir@umy.ac.id; [3] hasse@umy.ac.id; [4] nurmandi_achmad@umy.ac.id
* corresponding author

ARTICLE INFO

**Article history**
Received 2021-11-24
Revised 2021-12-11
Accepted 2022-01-12

**Keywords**
Presidential election
Election prediction
Social media
Election poll
Indonesia

ABSTRACT

This study aims to show whether Twitter analysis can predict and forecast candidates in the Indonesian presidential election in 2024. This study was conducted long before the election began. To reduce the gap and utopian attitude in analyzing, two forms of analysis were used at once, namely sentiment analysis and text searches on Twitter data. This study uses a quantitative approach with descriptive content analysis. The data was obtained from Twitter social media, with Twitter Search focusing on official accounts and topics surrounding the 2024 presidential election. The search and data collection first adjusted to the trend of poll results spread in online news. The trend resulting from the poll is used to adjust the names of candidates to be searched for on Twitter search. The analysis tool used also utilizes the Nvivo 12 Plus analysis software. This study succeeded in mapping out three potential candidates in the 2024 election, namely Anies Baswedan, Ganjar Pranowo, and Prabowo Subianto. The mapping of potential candidates also has correspondence with the results of opinion polls in newspapers. From these findings, the information and data on Twitter help make predictions and an alternative to using the poll method. The drawback of this study lies in the limited use of time, so it is recommended that further research be carried out to collect and analyze similar data regularly until the election period. This may indicate that Twitter can predict earlier or better than polls.



## 1. Introduction

Indonesia's presidential election is planned to be held again in 2024. Currently, there are many names of candidates who are being rumored and discussed to be running in the election. Based on the Poltracking Survey Institute with the poll method based on the three escalators, namely the regional head, general chairman of the party, and cabinet members. The Poltracking survey agency in October 2021 released the names of potential candidates such as Ganjar Pranowo, Prabowo Subianto, Anies Baswedan, Ridwan Kamil, Khofifah Indar Parawansa, Sandiaga Salahuddin Uno, Puan Maharani, Agus Harimurti Yudhoyono, Airlangga Hartarto, Gatot Nurmantyo, Andika Perkasa, Mahfud MD, Erick Thorir, and Muhaimin Iskandar. The survey results from the simulation of 15 names placed Ganjar Pranowo as a presidential candidate for 2024 with a percentage of 22.9%, the second Prabowo 20.0%, Anies Baswedan 13.5%, Ridwan Kamil 4.1%, Agus Harimurti Yudhoyono 3.3%, Sandiaga Uno 2.8%, Khofifah Indar Parawansa 2.5%, Puan Maharani 1.9%, Gatot Nurmantyo 1.2%, Andika Perkasa 1.2%, Airlangga Hartarto 1.0%, Erick Thohir 0.9%, Mahfud MD 0.8%, Muhaimin Iskandar 0.3%, and Zulkifli Hasan 0.2% [1].

The presidential election still has plenty of time left, but discussions about potential candidates are being discussed more and more frequently. This is discussed in the public sphere and Internet-based digital spaces such as social media and online news. The topic of the presidential election by observing potential candidates on several online news platforms also transformed into social media, and this was widely spread and sparked discussions among social media users. Some of the names of candidates who are rumored to be running as candidates also play an active role in social media, so this can also influence the public on online social networks to comment on the criteria for representing candidates in 2024. Debates on social media often trigger the emergence of predictive narratives about candidates. in the potential next election [2].

There have been many studies analyzing social media with elections. However, very few studies analyze the topic of election predictions using sentiment analysis and text search simultaneously, especially in observing the case of elections in Indonesia in the next 2024. Nevertheless, several related study results are considered quite relevant to support this study. First, social media is often associated with political events, including general elections [3], [4]. Second, election predictions can be made by conducting field surveys, opinion polls, and the social media approach is relevant to the current digitalization situation [5], [6]. Third, the recent election predictions use the sentiment analysis approach on social media as an essential reference in mapping the results of the analysis [7], [8]. Based on previous research, it is known that election predictions still often use conventional methods through polls, so it is considered necessary to present new alternatives that are more relevant to the digital activities of the community related to future political issues. This study tries to maximize two approaches: sentiment analysis and text search on Twitter.

The purpose of this study attempts to fill the gaps in previous research and a basis for reference in future research on election prediction studies using social media. Some of the research questions in this study can be described. (1) How sentiment analysis and text searches on social media can map potential candidates in the current 2024 presidential election in Indonesia? (2) Who is the candidate who is predicted to be decisive in the 2024 presidential election in Indonesia? (3) Whether the prediction results using social media analysis can be an alternative to the poll method? Based on these three questions, it is hoped that a search and analysis can be carried out on the political situation of the upcoming presidential election and seeing opportunities from other predictive methods outside of conventional opinion polls. This research is essential considering that very few studies use the election prediction method using sentiment analysis and text search in studying election cases in Indonesia. Based on previous research trends, it is also known that the topic of predicting elections is still relevant and becomes essential to help map the political situation, especially the initial preparation before the election, which is considered to help voter preferences in studying political issues and as an essential study for political participants in Indonesia.

## 2. Theorical Framework

### 2.1. Election Predictions and Forecast

Conventionally, predicting elections can be done using the poll method. Polling by-poll is always at least slightly wrong on election day, but certain election characteristics can make it more difficult or easier to predict [9]. In addition to the poll method, we can also use a more modern method by observing discussions and information on internet-based online social networks. There is an exponential growth in the number of internet users who use social media, especially Twitter, to share their views on various topics of common interest, including political issues. The interest of social media users in the political discourse also affects the results and a large amount of data in these online social networks. This big data is then considered to produce predictions and opportunities for political parties and politicians in an election [10]. The analytical method for predicting can be done with a volumetric approach, sentiment, and social networks to predict essential things from online social media platforms. It also relies heavily on the discussion by all social media users who share the same discussion interest. In general, many researchers use a sentiment analysis approach that maximizes understanding of public opinion, which will later be used to explore the general public's views. In this case, it will refer to a prediction or forecasting of election results [11].

The prediction results also have significant consequences for political campaigns and support for government agencies. Prediction results in some instances affect the prediction results of the general public. In the sense that the prediction results spread in the media will have an impact on the public's

decision to support the prediction results [12]. Thus, election predictions can also be politicized to influence the public's response favoring a particular candidate. Nevertheless, election results can be challenging to predict. The most recent example is the 2016 United States election, in which Hillary Clinton lost the five states she had predicted in advance. The difficulty of predicting election results is influenced by the diffusion of information and the socio-political dynamics that occur near the election [13]. This confirms that the prediction results may deviate from the actual results so that predictions are also very dependent on developing political dynamics, especially the diffusion of information approaching election day.

Prediction results can also be traced through an approach by collecting poll data. The more resources that are pooled, the more likely it is to be predictable as more information becomes available in the upcoming elections [14]. Approaches to utilizing social media are increasingly in demand, and the platform that is often used is Twitter. A characteristic of the social media approach is a sudden spike in political discussion, thus facilitating analysis with an unlimited amount of information. Moreover, the method used to combine the volume of information, sentiment, and social network information simultaneously is considered more effective in producing a recommendation based on the predicted results [15]. The analytical method approach using social media has attracted the attention of many global researchers. However, this approach also has a weakness in data bias, so a critique of the results and a review of the reported experimental prediction results are needed [16].

### 2.2. Sentiment Analysis and Text Search Query on Social Media

Sentiment analysis is the process of extracting human thoughts and perceptions from unstructured texts [17]. Sentiment analysis is also known as opinion mining which aims to extract people's opinions, attitudes, and emotions from social networks. Conventional sentiment analysis concentrates mainly on textual content. However, multimedia sentiment analysis has started to receive attention since visual content such as images and videos has become a new medium for self-expression on social networks [18]. Sentiment Analysis can be defined as the task of detecting, extracting, and classifying opinions about something. This involves developing ways of collecting and examining comments and opinions on issues posted on social media. This requires extraction efforts for in-depth analysis [19]. Sentiment analysis results are generally categorized as negative sentiment and positive sentiment [20].

Social media users' sentiments or opinions are influenced by current and inclusive information or issues [21]. The more important and exciting the information will impact the response of social media users to get involved in the discourse. The high interest of social media users in a discourse tends to affect the volume of discussion on social media, making it possible to conduct sentiment analysis. Of the various social media platforms, Twitter is considered quite popular, used by researchers in analyzing sentiment related to political and election issues, including predicting election results in several countries such as Indonesia [22]. In recent years, there has been increasing attention in the literature about the possibility of analyzing social media useful for polls ahead of elections. Some scholars claim that by doing so, we can also produce approximate results. Relying on sentiment analysis also serves to monitor elections as has been done in various countries such as the United States and Italy [23]. The use of the text search feature is used to save time when analyzing data [24].

### 2.3. Political Situation and Discussion on Social Media

In contrast to the anonymous environment of some Internet forums, social media is closely related to relationships and activities of daily life. Social media allows users to feel social bonds and influences attitudes and relationships between users in social networks. The relationship between the use of social media also has implications for relationships that discuss political issues. Social media is slowly shaping the awareness of opinions, interests, and activities of solid social ties. As such, the use of social media is likely to influence everyday conversations about political issues in online and offline contexts, including home, work, social gatherings with friends, community gatherings, and on social networking sites [25]. The resulting trend in the use of social media is related to political self-efficacy and situational political engagement [26].

Interaction on social media has a strong influence on the tendency to participate in politics. Social media plays a significant role in replacing traditional media, facilitating political engagement, strengthening strategic collaboration, and the potential to influence government decisions regarding

politics [27]. Social media is currently widely used to influence socio-political situations, such as in the case of general elections, political campaigns, political movements, and protests [28], [29], [30]. Thus the political situation and discussions are relevant on social media. This is due to the affordable online communication model on social media, which can be accessed anywhere and anytime. Social media also provides a means for the flow of ideas or opinions and serves to play an increasingly complex role in transformation in people's lives [31].

## 3. Method

This study uses a quantitative approach with descriptive content analysis. This approach describes the details of a text or message related to current discussions and information on the Twitter social network regarding the 2024 presidential election. The research subjects are Twitter social media users. The object of the research is seen from the involvement of Twitter social media users in the discourse of the 2024 presidential election in Indonesia. Data obtained from social media Twitter with Twitter Search focused on official accounts. The search and data collection first adjusted to the trend of poll results spread in online news. This study takes a sample of poll results from the Poltracking Survey Institute. This institution was chosen because it has conducted regular polls in Indonesia, especially early polls ahead of the 2024 election. The trends generated from polls by the Poltracking Survey Institute are used to adjust the names of candidates to be searched on the Twitter search and analyzed using sentiment analysis Twitter. This helps researchers to avoid bias in classifying data sources.

**Table 1.** Adjustment of Analyzed Data Sources

| Poll (Poltracking) | Twitter search (Official account) | Tweets captured |
|---|---|---|
| Ganjar Pranowo (22,9%) | @ganjarpranowo | 3066 Tweets captured |
| Prabowo Subianto (20,0%) | @prabowo | 1200 Tweets captured |
| Anies Baswedan (13,5%) | @aniesbaswedan | 2975 Tweets captured |
| Ridwan Kamil (4,1%) | @ridwankamil | 2490 Tweets captured |
| Agus Harimurti Yudhoyono (3,3%) | @AgusYudhoyono | 990 Tweets captured |
| Sandiaga Uno (2,8%) | @sandiuno | 1641 Tweets captured |
| Khofifah Indar Parawansa (2,5%) | @KhofifahIP | 2443 Tweets captured |
| Puan Maharani (1,9%) | @puanmaharani_ri | 302 Tweets captured |
| **Total** | **8 Candidate Accounts** | **15107 Tweets** |

Table 1 shows the results of adjusting the data sources analyzed in this study based on the results of Captured on 11/21/2021. The candidates who will be analyzed only take the highest poll results including Ganjar Pranowo with a percentage of 22.9%, the two Prabowo Subianto 20.0%, Anies Baswedan 13.5%, Ridwan Kamil 4.1%, Agus Harimurti Yudhoyono 3, 3%, Sandiaga Uno 2.8%, Khofifah Indar Parawansa 2.5%, Puan Maharani 1.9%. These candidates were used as the subject of a Twitter search to identify the candidate's official account.

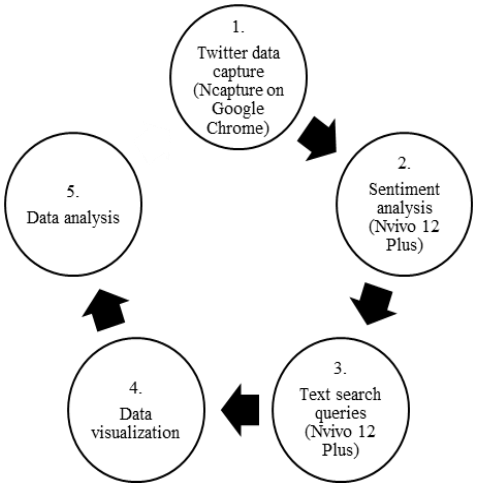


**Fig. 1.** Data analysis process.

Figure 1 is the stage of data retrieval carried out using Ncapture. Data is taken based on Twitter Search on the candidate's official account. The collected data is then transferred to the Nvivo 12 Plus analysis tool. Nvivo 12 plus software as an analysis tool that can display data in text and images through the data coding process. The analysis feature used is sentiment analysis. The sentiment analysis results are then continued by linking the topic in the 2024 presidential election by using a text search query approach. This feature is used to map the number of references that often appear on Twitter. The way it works is simple, namely by retrieving Twitter data based on Tweets about the 2024 presidential election on Twitter. The data obtained was then coded based on a text search related to the names of the candidates above. The trend in the coding results on the data is then visualized and followed by an in-depth analysis to answer research questions.

## 4. Results and Discussion

### 4.1. Candidate Mapping Based on Twitter Sentiment Identification and Text Search

The results of this study found several data trends that can be analyzed further to answer research questions about social media sentiment analysis associated with opportunities in mapping potential and strong candidates in the current 2024 presidential election in Indonesia and identify whether the prediction results can be an alternative. In addition to using conventional polling methods.

**Table 2.** Results of Twitter Sentiment Identification in General

| Official Account | Very negative | Moderately negative | Moderately positive | Very positive |
|---|---|---|---|---|
| @ganjarpranowo | 17,0% | 14,9% | 10,4% | 7,0% |
| @prabowo | 7,5% | 5,1% | 2,9% | 2,3% |
| @aniesbaswedan | 22,6% | 19,4% | 50,3% | 44,2% |
| @ridwankamil | 15,1% | 28,6% | 10,4% | 16,3% |
| @AgusYudhoyono | 13,2% | 12,6% | 6,8% | 9,3% |
| @sandiuno | 13,2% | 1,1% | 9,7% | 18,6% |
| @KhofifahIP | 7,5% | 15,4% | 7,5% | 2,3% |
| @puanmaharani_ri | 3,8% | 2,9% | 1,9% | 0,0% |

Table 2 shows some of the sentiment results on the candidates' Twitter. The results of the identification of these sentiments are very diverse and less specific about the presidential election. This is due to the collection of vast amounts of data. The data extracted in this analysis uses 15107 Tweets. This number affects this study to produce clear criteria for the 2024 presidential election. This study explores other factors, namely the distance between the analysis and the implementation of the election in 2024, which also affects the data collected. However, this study attempts to continue the analysis by adjusting the sentiment results above by coding the data with the text search feature.

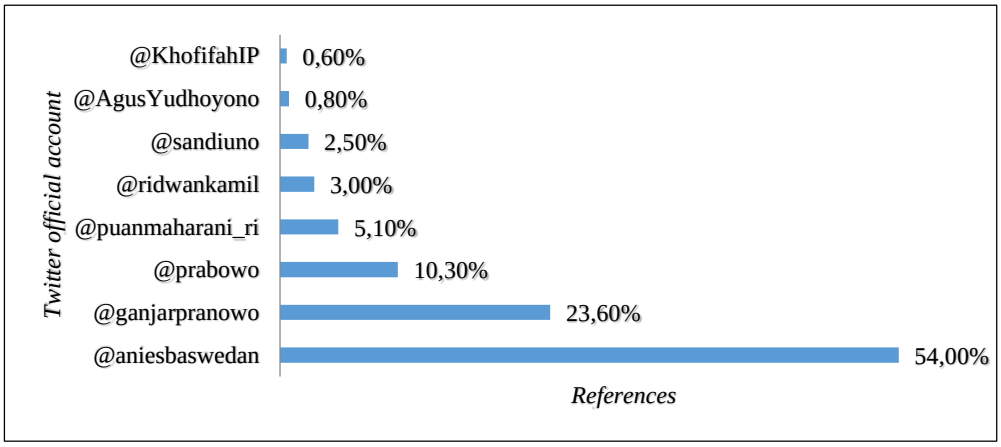


**Fig. 2.** Results of sentiment identification related to the 2024 presidential election with a text search.

Figure 2 finds a classification that allows the mapping of potential candidates. In the text search results, a clear significance was found between one candidate and another. The data shows that Anies Baswedan has the dominant number of references in Twitter discussions. Anies Baswedan with 54.00%, followed by other candidates namely Ganjar Pranowo 23.60%, Prabowo Subianto 10.30%, Puan Maharani 5.10%, Ridwan Kamil 3.00%, Sandiaga Uno 2.50%, Agus Harimurti Yudhoyono 0.80%, and Khofifah Indar Parawansa 0.60%. From this data, it is known that there are only three candidates who are considered to have strong ties to the 2024 presidential election. The candidates are Anies Baswedan, Ganjar Pranowo, and Prabowo Subianto. The trends in these three names also have similarities to the predictions results through polls by the Poltracking Survey Institute.

Based on the data above, it is known that the analytical method using sentiment analysis has limitations in the process of adjusting discussions about the 2024 presidential election. This affects the significance of mapping public discussions on Twitter social media to topics around the presidential election, whereas it is found to be significant when the analysis is continued with a text search approach. Strong on topics surrounding the 2024 presidential election. Analysis with text search allows researchers to find and parse the data sources collected by matching candidates' official accounts in public discussions. This makes it easier for this study to find direct specifications on discussions about the 2024 presidential election in Indonesia.

### 4.2. Prediction of Potential and Strong Candidates Based On Twitter Analysis of the 2024 Election

This study traces candidates who are considered potential to run as candidates in the 2024 presidential election in Indonesia. From the data coding process, several candidates were found that were considered potential and as alternative candidates.

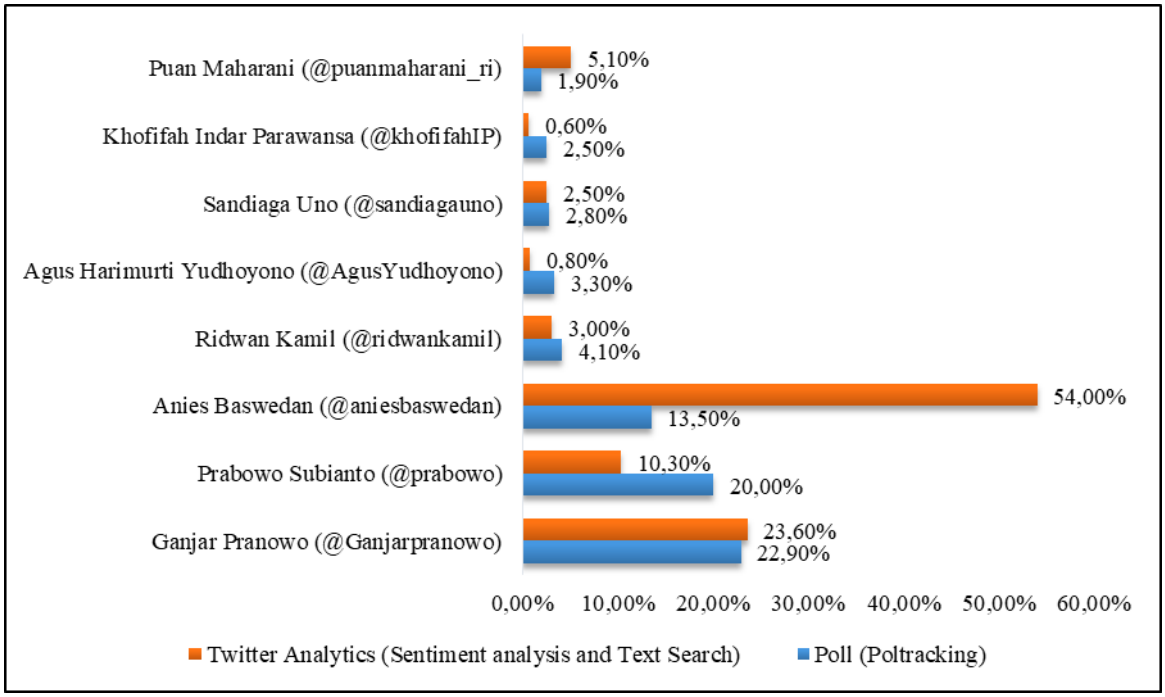


**Fig. 3.** Comparison of poll results with Twitter analytics.

Figure 3 shows that the Twitter data analysis does not change the names of the three candidates considered potential in the poll results. Ganjar Pranowo, Prabowo Subianto, and Anies Baswedan are still strong candidates at this time to run as presidential candidates in 2024 based on Twitter analysis and opinion polls. The results of this Twitter analysis only found candidate propositions that were significantly different from the results of the previous poll. Of the three candidates, Anies Baswedan has a significant percentage jump in poll results. From the polling approach sequentially occupied by Ganjar Pranowo (22.90%), Prabowo Subianto (20.00%), and Anies Baswedan (13.50%). From the Twitter analysis approach that relies on sentiment analysis and text searches, the

strong candidates are Anies Baswedan (54.00%), Ganjar Pranowo (23.60%), and Prabowo Subianto (10.30%). The other candidates are considered as alternative candidates in the 2024 election.

From the trend of the data above, it is known that there are only three potential and strong candidates currently for issues surrounding the 2024 presidential election in Indonesia, namely Anies Baswedan, Ganjar Pranowo, and Prabowo Subianto. The three names are in accordance with the current Twitter poll and analysis results, although the significance of the three has different percentages based on the analytical approach carried out through the poll method with sentiment analysis and text search on Twitter. Even so, the analytical approach to predicting the upcoming election both utilizes public opinion, but the Twitter approach is considered one of the proper methods to predict the next election because Twitter social media has a huge amount of data based on public opinion with machine learning to find emotions in tweets and predict sentiment score [32], [33]. Based on the interest of previous studies on Twitter analysis in predicting and estimating, it can be seen that the method based on sentiment analysis provides the most accurate predictions [34].

### 4.3. Opportunities for Sentiment Analysis and Text Search on Twitter as Election Prediction Methods

Other approaches used in predicting election results often take advantage of several approaches in the historical approach, which uses the results of previous elections, and the campaign approach, which is used to estimate the share of votes at the end of the campaign. In addition, another approach is also known, namely the poll. [35], [36]. This study does not intend to belittle the predictive approaches above, and this study tries to provide another offer to adjust the development trend of technology and information, especially in Indonesia. This study tries to use a different approach: Twitter social media by conducting sentiment analysis and text search. These two approaches are used to map the names of potential candidates in the upcoming presidential election in Indonesia.

The prediction system utilizes Twitter's data source by using two approaches at once, namely sentiment analysis and text search, which is considered to contribute to mapping the names of potential candidates in the upcoming presidential election because this approach follows real-time discussions on online social media networks such as Twitter. This approach is used to achieve a higher prediction rate and is more relevant to the political situation leading up to the election. It depends on the ability of researchers to design the prediction methods and frameworks sought, especially when using social media as a data source. This highlights the ability to map and narrow the range of discussions on Twitter to be analyzed and be used as a data source to support predictive results.

This study shows some differences in the predictive power of social media data using the poll method. Some aspects support why social media analysis with a sentiment analysis approach and text search can contribute to mapping predictive results in the future. *First*, social media stores vast amounts of data. *Second*, the data on social media is a reflection of the socio-political situation. *Third*, social media is a discussion space for all groups so that public attitudes and responses can be easily observed. Apart from that, the analysis of social media used in predicting the election also needs to pay attention to the distance or period of the analysis with the schedule for holding the election. This helps other researchers reduce gaps in data sources that are relevant or irrelevant in the analysis process. It also encourages researchers to avoid utopian thinking.

This study was conducted three years before the election period began in 2024. The concern of this study lies in the long period, but it can be minimized by using two approaches at once, namely sentiment analysis and text search on Twitter social media. These two approaches have a bond that can support the analysis and presentation of more relevant data to the topic around the 2024 election. Thus, analysis using a social media approach is considered another alternative to the polling approach in predicting or forecasting candidates who are considered potential candidates. As the official candidate in the upcoming 2024 presidential election. This study mapped out three potential candidates, namely Anies Baswedan, Ganjar Pranowo, and Prabowo Subianto.

In addition to the success of the sentiment analysis approach and text search on Twitter in making predictions by presenting the results of potential mapping candidates in the upcoming elections, this research also finds other challenges that need to be considered, namely the problem of research bias and ambiguity. Twitter has a significant data source with a vast amount of data in the

results of online discussions, which sometimes still find ambiguity, making it difficult for researchers to obtain information [37]. This tendency can be overcome by classifying the text according to the sentiment conveyed in the Twitter discussion. This study proposes to characterize positive and negative reviews by first reviewing the research object's determination. Research objects relevant to the issues surrounding the 2024 presidential election were determined earlier by a Twitter search. Twitter search classification helps limit ambiguity in the information obtained to be more relevant to get more relevant prediction results.

## 5. Conclusion

This study intends to show whether and how Twitter analysis can predict candidates in the Indonesian presidential election in 2024. Regardless of the election year, which is three years from now, this study approaches by maximizing two forms of analysis, namely sentiment analysis and text search. Using these two forms of analysis helps this study reduce gaps in the data sources analyzed to become more relevant to topics around elections. Both forms of analysis also reduce researchers in presenting utopian data. This study succeeded in mapping out three potential candidates in the 2024 election, namely Anies Baswedan, Ganjar Pranowo, and Prabowo Subianto. The mapping of potential candidates also corresponds with the results of opinion polls in newspapers. From these findings, the information and data on Twitter help make predictions and an alternative to using the poll method. The findings of this study also provide a new framework for predicting election results by utilizing Twitter data sources with an approach following current technological developments, namely sentiment analysis and text search on Twitter. This approach is considered more flexible because it takes data from discussions in real-time on online social networks such as Twitter. Without ruling out other forms of approach, this study is quite helpful in mapping prediction results for the better. The drawback of this study lies in the limited use of time, so it is recommended that further research be carried out to collect and analyze similar data regularly until the election period. This may indicate that Twitter can predict earlier or better than polls.

## References

[1] R. N. Chaterine and D. Meiliana, "Presidential Candidate Electability Survey 2024, Ganjar is in First Place, Followed by Prabowo and Anies Baswedan," kompas.com, 10-Oct-2021. https://bit.ly/3mDBia3

[2] J. Visser, B. Konat, R. Duthie, M. Koszowy, K. Budzynska, and C. Reed, "Argumentation in the 2016 US presidential elections: annotated corpora of television debates and social media reaction," Lang. Resour. Eval., vol. 54, no. 1, pp. 123–154, 2020.

[3] C. B. Williams, "Introduction: Social media, political marketing and the 2016 U.S. election," J. Polit. Mark., vol. 16, no. 3–4, pp. 207–211, 2017.

[4] D. H. Kim, S. M. Jones-Jang, and K. Kenski, "Why Do People Share Political Information on Social Media?," Digit. Journal., vol. 9, no. 8, pp. 1123–1140, 2021.

[5] D. J. S. Oliveira, P. H. de S. Bermejo, and P. A. dos Santos, "Can social media reveal the preferences of voters? A comparison between sentiment analysis and traditional opinion polls," J. Inf. Technol. Polit., vol. 14, no. 1, pp. 34–45, 2017.

[6] M. Huberty, "Can we vote with our tweet? On the perennial difficulty of election forecasting with social media," Int. J. Forecast., vol. 31, no. 3, pp. 992–1007, 2015.

[7] H. Schoen, D. Gayo-Avello, P. Takis Metaxas, E. Mustafaraj, M. Strohmaier, and P. Gloor, "The power of prediction with social media," Internet Res., vol. 23, no. 5, pp. 528–543, 2013.

[8] B. Bansal and S. Srivastava, "On predicting elections with hybrid topic based sentiment analysis of tweets," Procedia Comput. Sci., vol. 135, pp. 346–353, 2018.

[9] J. Sohlberg and A. Branham, "Just a Difficult Election to Poll ? How Context Affects Polling Accuracy," Surv. Methods Insights from F., pp. 1–17, 2020.

[10] P. Singh, Y. K. Dwivedi, K. S. Kahlon, A. Pathania, and R. S. Sawhney, "Can twitter analytics predict election outcome? An insight from 2017 Punjab assembly elections," Gov. Inf. Q., vol. 37, no. 2, p. 101444, 2020.

[11] P. Chauhan, N. Sharma, and G. Sikka, "The emergence of social media data and sentiment analysis in election prediction," J. Ambient Intell. Humaniz. Comput., vol. 12, no. 2, pp. 2601–2627, 2021.

[12] K. Searles, G. Smith, and M. Sui, "Partisan media, electoral predictions, and wishful thinking," Public Opin. Q., vol. 82, pp. 888–910, 2018.

[13] M. Galesic, W. Bruine De Bruin, M. Dumas, A. Kapteyn, J. E. Darling, and E. Meijer, "Asking about social circles improves election predictions," Nat. Hum. Behav., vol. 2, no. 3, pp. 187–193, 2018.

[14] R. Kennedy, S. Wojcik, and D. Lazer, "Prediction Internationally," 2017.

[15] K. Jaidka, S. Ahmed, M. Skoric, and M. Hilbert, "Predicting elections from social media: a three-country, three-method comparative study," Asian J. Commun., vol. 29, no. 3, pp. 252–273, 2019.

[16] D. Rousidis, P. Koukaras, and C. Tjortjis, "Social media prediction: a literature review," Multimed. Tools Appl., vol. 79, no. 9–10, pp. 6279–6311, 2020.

[17] F. Hemmatian and M. K. Sohrabi, "A survey on classification techniques for opinion mining and sentiment analysis," Artif. Intell. Rev., vol. 52, no. 3, pp. 1495–1545, 2019.

[18] Z. Li, Y. Fan, B. Jiang, T. Lei, and W. Liu, "A survey on sentiment analysis and opinion mining for social multimedia," Multimed. Tools Appl., vol. 78, no. 6, pp. 6939–6967, 2019.

[19] B. Saberi and S. Saad, "Sentiment analysis or opinion mining: A review," Int. J. Adv. Sci. Eng. Inf. Technol., vol. 7, no. 5, pp. 1660–1666, 2017.

[20] C. Dhaoui, C. M. Webster, and L. P. Tan, "Social media sentiment analysis: lexicon versus machine learning," J. Consum. Mark., vol. 34, no. 6, pp. 480–488, 2017.

[21] L. Yue, W. Chen, X. Li, W. Zuo, and M. Yin, "A survey of sentiment analysis in social media," Knowl. Inf. Syst., vol. 60, no. 2, pp. 617–663, 2019.

[22] W. Budiharto and M. Meiliana, "Prediction and analysis of Indonesia Presidential election from Twitter using sentiment analysis," J. Big Data, vol. 5, no. 1, pp. 1–10, 2018.

[23] A. Ceron, L. Curini, and S. M. Iacus, "Using Sentiment Analysis to Monitor Electoral Campaigns: Method Matters—Evidence From the United States and Italy," Soc. Sci. Comput. Rev., vol. 33, no. 1, pp. 3–20, 2015.

[24] J. Blaney, K. Filer, and J. Lyon, "Assessing high impact practices using NVivo: An automated approach to analyzing student reflections for program improvement," Res. Pract. Assess., vol. 9, pp. 97–100, 2014.

[25] K. N. Hampton, I. Shin, and W. Lu, "Social media and political discussion: when online presence silences offline conversation," Inf. Commun. Soc., vol. 20, no. 7, pp. 1090–1107, 2017.

[26] M. J. Kushin and M. Yamamoto, "Did social media really matter? college students' use of online media and political decision making in the 2008 election," Mass Commun. Soc., vol. 13, no. 5, pp. 608–630, 2010.

[27] A. Getachew and T. Beshah, "The Role of Social Media in Citizen's Political Participation," in IFIP Advances in Information and Communication Technology, 2019, vol. 558, pp. 487–496.

[28] D. Kreiss, R. G. Lawrence, and S. C. McGregor, "In Their Own Words: Political Practitioner Accounts of Candidates, Audiences, Affordances, Genres, and Timing in Strategic Social Media Use," Polit. Commun., vol. 35, no. 1, pp. 8–31, 2018.

[29] F. Marozzo and A. Bessi, "Analyzing polarization of social media users and news sites during political campaigns," Soc. Netw. Anal. Min., vol. 8, no. 1, 2018.

[30] F. Suwana, "What motivates digital activism? The case of the Save KPK movement in Indonesia," Inf. Commun. Soc., vol. 23, no. 9, pp. 1295–1310, 2020.

[31] P. Sobkowicz, M. Kaschesky, and G. Bouchard, "Opinion mining in social media: Modeling, simulating, and forecasting political opinions in the web," Gov. Inf. Q., vol. 29, no. 4, pp. 470–479, 2012.

[32] P. Salunkhe and S. Deshmukh, "Twitter Based Election Prediction and Analysis IRJET Journal Twitter Based Election Prediction and Analysis," Int. Res. J. Eng. Technol., vol. 4, no. 10, pp. 539–544, 2017.

[33] R. Martins, P. Henriques, and P. Novais, "Predicting an election ' s outcome using sentiment analysis Dataset creation," in In World Conference on Information Systems and Technologies, 2020, pp. 134–143.

[34] M. M. Skoric, J. Liu, and K. Jaidka, "Electoral and public opinion forecasts with social media data: A meta-analysis," Information, vol. 11, no. 4, pp. 1–16, 2020.

[35] É. Bélanger and S. Soroka, "Campaigns and the prediction of election outcomes: Can historical and campaign-period prediction models be combined?," Elect. Stud., vol. 31, no. 4, pp. 702–714, 2012.

[36] R. S. Erikson and C. Wlezien, "Markets vs. polls as election predictors: An historical assessment," Elect. Stud., vol. 31, no. 3, pp. 532–539, 2012.

[37] A. Valdivia, M. V. Luzón, E. Cambria, and F. Herrera, "Consensus vote models for detecting and filtering neutrality in sentiment analysis," Inf. Fusion, vol. 44, pp. 126–135, 2018.