

# Sentiment Analysis of YouTube Comments: Potential Indonesian Presidential Election Candidates

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**Abstract:** This study examines the public's sentiments toward potential candidates for the 2024 Indonesia presidential election. This study utilized YouTube comments on the Kompas TV channel, which features videos from potential presidential candidates, as its data source. Coberry is used to download YouTube comments, which are then analyzed using Python using the Pandas Library, matplotlib, wordcloud, and textblob. This study aims to determine the public's response to presidential candidates in the general election of 2024. This study shows that the public has positive sentiments toward the three presidential candidates named Ganjar Pranowo, Anies Baswedan, and Prabowo Subianto.

**Keywords:** sentimental analysis, YouTube comments, presidential election, WordCloud, Python, Coberry, Tidyverse, Textblob

## 1. INTRODUCTION

Television and radio have been the primary entertainment media for many people in the past few years. However, with the rapid development of information technology and the increasing number of internet users, social media has become the preferred entertainment media. For example, watching YouTube videos is more attractive for many people than watching television or listening to the radio. YouTube allows users to earn money through AdSense or by directly endorsing certain products or services. YouTube has become the most popular online video-viewing website because it has compensated some creators for the past 15 years [1]. YouTube will likely unveil additional methods for content creators to commercialize their videos and place advertisements in Shorts soon [2]. YouTubers with Millions of subscribers mostly have a team like a video editor, content creator, video graphed, content writer, and video graphics. Maintaining an engaged channel of YouTube to the customer requires the content creators to upload new video content regularly.

Besides public figures, politicians also use social media to gain popularity and use social media as a pipeline to reach people. Today, politicians use social media to promote their work to the public, which can positively affect their electability. For example, two years into the presidential election in Indonesia, the public wanted to know the nominated president from a political party in Indonesia. As a result, Kompas TV nominated Ganjar Pranowo, Anies Baswedan, and Prabowo Subianto as some potential presidential candidates for the Republic of Indonesia in 2024 [3].

This study aims to analyze public sentiment on the electability of the three presidential candidates for the upcoming Indonesian presidential elections in 2024 by analyzing the comments column on the Kompas TV YouTube channel, which has the content of the three candidates. This study will use descriptive data analytics to represent the data retrieved from Kompas TV YouTube channel comments. In addition, this study will analyze the public response to the names of presidential candidates whom various political parties in Indonesia represent. There are three hypotheses from this study as follows.

H1: Ganjar Pranowo, a potential Indonesian presidential candidate for election in 2024, has a positive sentiment.

H2: Anies Baswedan, a potential Indonesian presidential candidate for election in 2024, has a positive sentiment.

H3: Prabowo Subianto, a potential Indonesian presidential candidate for election in 2024, has a positive sentiment.

The research question is that among the three potential presidential candidates: Ganjar Pranowo, Anies Baswedan, and Prabowo Subianto, which presidential candidate has the highest percentage of positive sentiment from the public?

## 2. RESEARCH METHODOLOGY

### 2.1 Software

There were two pieces of software used in this study: Coberry and Python. Coberry is open-source software that allows users to easily download YouTube comments, regardless of who owns the channel [4]. Using Coberry, it is simple to extract all YouTube comments and save them in CSV file format. Using Coberry required two steps: copying a YouTube link from which will download the comment dataset and pasting the link to the column for download. The dataset was in CSV file format and consisted of a few columns. Although the dataset was clean, the researchers performed a cleaning dataset to clean the emojis and emoticons. The second piece of software was visual studio code. It is also open-source software, an Integrated Development Environment (IDE) for Python, a statistical computing and graphics programming language. In this study, the researchers used a variety of Python libraries to assist with analyzing the dataset.

### 2.2 Data Collection and Cleaning

Nowadays, not only individuals who collect and produce data from social media, but many profit and non-profit organizations also take advantage of social media as data sources. Data collection may exist in any form that is either useful or useless. Once the establishment of relation data connections, information surfaces allow individuals to explain knowledge beyond the range of their senses. Organizing, synthesizing, and summarizing information is the foundation of the data and information values to increase comprehension [5]. Therefore, data analytics used to represent an essential arrangement of the data become valuable. The four data analytics categories are descriptive, predictive, diagnostic, and prescriptive [6].

The YouTube comments from the Kompas TV YouTube channel are the data sources of this study. The data was

retrieved and extracted from YouTube comments to CSV file format and called the dataset with read.csv in visual studio code. In this study, the researchers transformed the unstructured text into structured data for easy analysis using the text-mining approach. Text mining is a vast discipline that involves several techniques and technology for extracting interesting and meaningful patterns from textual data sources to uncover a relevant pattern. Some text mining methods included information extraction, retrieval, categorization, clustering, and summarization [7]. Text mining techniques aim to analyze exciting and relevant information effectively and efficiently from large amounts of unstructured data [8].

This study discovers the significance of text classification, as it is necessary to categorize documents based on their content into predetermined categories. The categorization in text mining applied in this research can use as the foundation for the study to categorize the users with positive or negative comments to the YouTube content. The study about analysis and classification of user comments on YouTube videos can classify the comments into four categories such as relevant, irrelevant, positive, and negative, based on the relevancy of the comments to the video content as described in the video description [9].

Besides categorizing the user's comments, this study also used categorization to count the most frequently used words in YouTube comments. The researchers used the WordCloud library to generate word clouds from the CSV file containing the YouTube comments [10]. Data cleansing is used in the data preparation phase to repair and delete inaccurate and incomplete data extracted from YouTube comments, including emojis and emoticons. The data cleaning process begins by checking whether the data is empty or not in the CSV column. After that, clear the sentence from the emoji and emoticons in the comment column. The next step is translating the comment column into English. Its function is to make it easier to analyze sentiment analysis because the library function on WordCloud is more optimal using English.

### 2.3 Visualization

Visualization is a method and approach for creating images and diagrams to illustrate the analysis results. It is a discursive resource utilized to present statistical information and frequently numerical data in various graphs, charts, and maps, to explain, convince, and narrate a narrative [11]. The objective of information visualization is to visually portray various types of data to facilitate and strengthen cognition by providing intuitive means for information perception and manipulation [12]. Data visualization results from several preprocessing tasks, including data extraction and cleaning.

WordCloud is a frequently used method for visualizing data in data mining. For data visualization using Python, there is a library named WordCloud. This study used the WordCloud library to visualize and analyze the data. Before performing the WordCloud, the researchers ensured that the data were clean and had a matrix dimension. The first data visualization called the function WordCloud specifies the number of frequent terms that should be displayed. The second visualization showed the analysis's sentiment. This study used the package sentimentr to perform sentiment analysis. Sentimentr is a tool for fast calculating text polarity sentiment in the English language at the sentence level with the option of aggregating results by rows or grouping variables. The visualization in this study used was the word's simple histogram value.

### 2.4 Sentiment Analysis

Sentiment analysis is a subfield of natural language analytics that seeks to correlate the generally presented in an unstructured fashion with belief and acknowledgment [13]. Sentiment analysis, often known as opinion mining, is a natural language processing technique for interpreting and categorizing emotions in subjective data such as emails, social media posts, and survey results. Sentiment analysis aims to define automatic tools to extract subjective information from texts written in natural languages, such as opinions and sentiments, to develop structured and valuable knowledge for either a decision support system or a decision maker [14]. Sentiment analysis is used for this study to systematically identify subjective information through natural language processing and text analysis.

In this study, there were four phases for sentimental analysis, including data gathering, text cleaning, data analysis, and understanding the results. Text cleaning was challenging for the sentimental analysis because the YouTube comments were in Indonesian. Unfortunately, r had a limited package or resources for conducting sentiment analysis in languages other than English. So, the researchers founded a lexicon for Indonesian to weigh the word and a list of Indonesian words to help steam the words. So, the first process for sentiment analysis was using a lexicon in Indonesian to make graph values of words. Then, the second step was using Bing Function from the Tidyverse package to make a histogram of the positive and negative sentiment [15].

## 3. RESULTS AND DISCUSSION

People have turned to the television and radio to acquire the latest news and enjoy themselves in their leisure time for the past three decades. However, YouTube has gradually shifted the public's interest toward traditional media such as television, radio, newspapers, and magazine [16]. As a result, it has revolutionized how people obtain the latest information and pleasure. Previously, individuals tended to wait until prime time to watch the news. For example, in the morning before work and the evening after work. However, with the advancement of internet technology, people can watch news anytime and anywhere because many national televisions adapt to technological advances by opening the news channel on YouTube.

In Indonesia, national television stations like Metro TV and Kompas TV have a YouTube channel to disseminate the latest news. The researchers use Kompas TV YouTube channel as a case study in this study. Kompas TV is a nationwide private news television network that provides breaking national, international, political, economic, sports, and entertainment news [17]. Kompas TV started as a newspaper company and then developed by establishing a national TV service launched on 9 September 2011 and currently has a YouTube channel named KOMPASTV with about 13.3 million subscriptions [18][19].

Although some potential presidential candidates declared being ready to become presidential candidates in 2022, there have been several names of strong candidates for the 2024 presidential candidates circulating, as mentioned earlier in the introduction section for Indonesian president election in 2024. The candidates are Ganjar Pranowo (@ganjar\_pranowo), who is currently a Governor of Central Java; Anies Baswedan (@aniesbaswedan), who is currently a Governor of Jakarta; and Prabowo Subianto (@prabowo) who is currently a Ministry of Defense of Republic Indonesia. Those three potential candidates actively use social media, Instagram, to

connect with the public. However, only Ganjar Pranowo and Anies Baswedan who have the official YouTube account. Prabowo Subianto participated in the election as vice president in 2009 and the presidential election in 2014 and 2019. Unfortunately, he did not win those three previous elections.

A commonly known technique in measuring electability is to survey the public. However, this study experimented to see the electability of the presidential candidate with a new method, sentimental analysis. These results can order strong candidates based on public YouTube comments. In conducting the electability survey, parties or presidential candidates usually hire independent surveys to conduct surveys. Some weaknesses of the organization independence of the survey include the discrepancies between the data analysis techniques and the conclusions drawn in the survey findings [20]. Apart from terms of cost, for getting the sentimental analysis using Python and some of the packages provided on Python, the advantage of using this method was to minimize the possibility of data bias by using the population sampling frame. However, the challenge lies with the user who comments because, in today's digital era, there is a buzzer term, namely an organized and a paid troop of netizens, to comment on social media to benefit, on the one hand, such as popularity or leading opinions.

### 3.1 WordCloud Analysis

The first WordCloud is a Kompas TV YouTube video about Ganjar Pranowo [21]. The word “president” from the YouTube video may conclude that there is hope from the Indonesian citizen for him to be a presidential candidate in the 2024 presidential election.



Figure. 1 WordCloud of Ganjar Pranowo YouTube Video Comments

The result of figure 1 shows that the word that often comes out is PPP, where PPP stands for Partai Persatuan Pembangunan. It is an Islamic-based political party in Indonesia. There is a possibility that the PPP would support or declare Ganjar Pranowo as a presidential candidate in the 2024 Indonesian presidential election, even though the PPP needed a coalition of other parties. In CloudWord, there is also the word Anies Baswedan. He is also one of the potential candidates for the upcoming Indonesian presidential election. On the YouTube video of Ganjar Pranowo, other words mostly appeared, including candidate, support, and party. The words appeared from WordCloud analysis shows that Ganjar Pranowo is a promising potential candidate for Indonesian president in 2024. However, further investigation is needed because WordCloud only displays words that often appear, so the word can still have a positive or negative meaning.



Figure. 2 WordCloud of Anies Baswedan YouTube Video Comments

Figure 2 above shows the YouTube video comment WordCloud for Anies Baswedan [22]. The word that often appears is Nasdem. Nasdem stands for Nasional Demokrat, is a political party established in 2011. Recently, Nasdem could nominate Anies Baswedan as a potential presidential candidate from this party. The average words that appear are positive. The words DKI and Jakarta also appeared because Anies Baswedan is currently a Governor of DKI Jakarta. Similar to Ganjar Pranowo, WordCloud generates words like president candidate.



Figure. 3 WordCloud of Prabowo Subianto YouTube Video Comments

Figure 3 above shows the WordCloud from the Kompas TV YouTube video for Prabowo Subianto [23]. On WordCloud, there is no Gerindra word appeared. Gerindra is a political party in Indonesia led by Prabowo Subianto. In contrast, the word Nasdem appeared on WordCloud. The word Ganjar Pranowo and Anies Baswedan also appeared in the WordCloud of Prabowo Subianto above because the public may compare Prabowo Subianto with these potential candidates. Words that often appeared are the same as the previous WordCloud for Ganjar Pranowo and Anies Baswedan: president and candidate. Nevertheless, the dominant word that emerged was Prabowo.

### 3.2 Sentimental Analysis

In the following analysis using textblob, the researchers used polarity as an analysis material with a value of 1 as a positive sentiment sentence and -1 as a negative sentiment, and 0 as a neutral sentiment. Then, the researchers aggregate the number of negative, positive, and neutral sentiments into the histogram chart.

The three tables below show the sentimental analysis for Ganjar Pranowo, Anies Baswedan, and Prabowo Subianto. In addition, the table contains the real YouTube comments, cleansing comments, cleansing comments translated to English, and the polarity.

Table. 1 Sentimental Analysis for Ganjar Pranowo

Content	Cleansing Comment	English Comment	Pol
Maaf saya mau nanya prestasinya gnjar apa	Maaf saya mau nanya prestasinya gnjar apa	Sorry I want to ask achievement of mr ganjar	-1
Hati hati ppp jangan salah pilih capres bisa bisa ga masuk senayan	Hati hati ppp jangan salah pilih capres bisa bisa ga masuk senayan	Be careful PPP don't choose wrong presidential	-1
Wkwkwk p3 mengusung ganjar, aneh dech	Wkwkwk p3 mengusung ganjar, aneh dech	Wkwkwk, P3 carries Ganjar, weird dech	-1
PPP cerdas mengusung gnjar	PPP cerdas mengusung gnjar	PPP smar carrying ganjar	1
Siap dukung ganjar pilpres 2024 apapun partainya	Siap dukung ganjar pilpres 2024 apapun partainya	Ready to support ganjar pilpres 2024 whatever his party	1
Kami pilih ppp jika benar dukung ganjar	Kami pilih ppp jika benar dukung ganjar	We choose PPP, if it is true support gankar	1
Anies yang Amanah yang berpihak sama rakyat	Anies yang Amanah yang berpihak sama rakyat	Anies who is trustworthy	0
Ppp hancu kalua pilih gnjar	Ppp hancu kalua pilih gnjar	Ppp is destroyed if you choose ganjar	0
Pak Ganjar dinanti yang dekat dari semua golongan	Pak Ganjar dinanti yang dekat dari semua golongan	Pak ganjar in the future who is close to all the group	0

Table 1 shows some of the YouTube comments for Ganjar Pranowo. Some YouTube comments questioned Ganjar Pranowo's accomplishments as Central Java governor and said he is not the best candidate for the 2024 presidential election. On the other hand, some people state they are willing to support Ganjar Pranowo's candidacy for the Republic of Indonesia in 2024. In addition, researchers observed that some neutral comments support other presidential candidates, such as Anies Baswedan.

Table. 2 Sentimental Analysis for Anies Baswedan

Content	Cleansing Comment	English Comment	Pol
PDIP takut kalah	PDIP takut kalah	PDIP is afraid of losing	-1
Banteng idiot	Banteng idiot	Idiot Bull	-1
Anies bkn jawa tulen sulit RI 1	Anies bkn jawa tulen sulit RI 1	Anies Bkn	-1
1000% nasdem mencalonkan anies keok 2024	1000% nasdem mencalonkan anies keok 2024	1000% nasdem nominates anies for 2024	0
Nasdem 2024 cium kanvas	Nasdem 2024 cium kanvas	Nasdem 2024 kiss Kanvas	0
Nasdem 2024 cium kanvas	Nama partainya adalah Nasdem	Now the name of the party nasdem	0
Semoga anies dipilih, di rumah gw dikasih wifi gratis kalau setiap hujan	Semoga anies dipilih, di rumah gw dikasih wifi gratis kalau setiap hujan	I hope anies is chosen, at home I was given a free wifi if every rain I	1

gratis kalau setiap hujan rumah gw gak pernah kena banjir padahal rumah gw kecil	rumah gw gak pernah kena banjir padahal rumah gw kecil	never flood eventhough my house is small	
Nasdem apa kau tak lihat itu di DKI gimana siap siaplah kau tenggelam Nasdem	Nasdem apa kau tak lihat itu di DKI gimana siap siaplah kau tenggelam Nasdem	Nasdem do you not see it in DKI, how come you are ready	1
Siapapun calonnya yang penting yang jadi harus PRIBUMI	Siapapun calonnya yang penting yang jadi harus PRIBUMI	Whoever the candidate is important who must be native	1

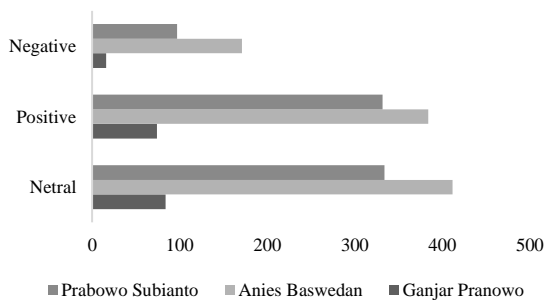
Table 2 above shows some YouTube comments about Anies Baswedan. Some sentiments categorize as positive, negative, and neutral. Among the numerous positive sentimental YouTube comments, some comments are typically negative. For example, even if Anies Baswedan contested the presidential election in 2024, he would still lose. In addition, there are opinions regarding Anies Baswedan's government in Jakarta. There have been no presidents outside Java, even though Anies Baswedan is of Javanese and Arab descent.

Table. 3 Sentimental Analysis for Prabowo Subianto

Content	Cleansing Comment	English Comment	Pol
Prabowo sudahlah wajahmu sdudah terlalu Lelah haha	Prabowo sudahlah wajahmu sdudah terlalu Lelah haha	Prabowo nevermind your face is too tired hahaha	-1
Nasdem Keok 2024 partai gak konsisten	Nasdem Keok 2024 partai gak konsisten	Nasdem is 2024 the party is not consistent	-1
Dulu pendukung Prabowo sekarang saya sarankan prabowo sudahlah anda da tua serahkan sama yang muda	Dulu pendukung Prabowo sekarang saya sarankan prabowo sudahlah anda da tua serahkan sama yang muda	In the past prabowo's supporter now I suggest that Prabowo is already old	-1
Ayo tenggelamkan partainya brewok	Ayo tenggelamkan partainya brewok	Let sink the party beard	0
Selamat pak Prabowo jadi capres abadi	Selamat pak Prabowo jadi capres abadi	Congratulation pak Prabowo jadi presedential candidate	0
Prabowo ganjar untuk RI 2021	Prabowo ganjar untuk RI 2021	Prabowo ganjar for RI 2024	0
Astaqfirullah pak Prabowo bukan negarawan sukses buat pak surya paloh	Astaqfirullah pak Prabowo bukan negarawan sukses buat pak surya paloh	Astaqfirullah mr Prabowo is not a statesman success for mr surya paloh	1
Mau menang duet Prabowo-oklh	Mau menang duet Prabowo-ganjar oklh	Want to win the duet Prabowo-ganjar oklh	1

ganjar oklh			
Selamat tinggal untuk Prabowo tk2024 welcome back anies baswedan muncul 2024	Selamat tinggal untuk Prabowo welcome back anies baswedan muncul 2024	Goodbye to Prabowo for 2024 welcome back anies baswedan appered 2024	1

Table 3 above shows some YouTube comments about Prabowo Subianto. There were some negative comments appeared on this YouTube comments. One statement related to "lying" might show as a form of disappointment from the public towards him. Researchers observe that many YouTube comments regarding Prabowo Subiatno are neutral. However, this presents another issue in assessing the natural language process, as there are neutral-sounding remarks whose actual meaning is negative due to the usage of idioms. For instance, the YouTube comment "ayo tenggelamkan partainya brewok" refers to the destruction of the Nasional Demokrasi party. The term "brewok" referred to the Nasional Demokrasi party led by Surya Paloh, who has a beard, and the YouTube comments urged the party's not to nominate Anies Baswedan as the presidential candidate.



The researcher uses the graph above to show the percentage of public comments based on sentimentality. Potential presidential candidate Anies Baswedan has more YouTube comments than the other two potential presidential candidates YouTube comments. So Anies Baswedan has more YouTube comment samples, namely 967 comments. This number was followed by potential presidential candidates Prabowo Subianto and Ganjar Pranowo, with 763 and 174 comments, respectively. From the results above, Ganjar Pranowo has fewer negative sentiment YouTube comments than the 9.2% of the other two candidates. On the other hand, Anies Baswedan is the potential candidate for president who has the highest negative sentiment in YouTube comments, reaching 17.7%. Meanwhile, for positive sentiment, all three have relatively the same percentage with a 40-44% range.

#### 4. FUTURE WORK

Based on the results of this sentimental analysis measurement, the study determined that some YouTube comments had an inaccurate polarity, such as the public's usage of idioms, which translated as a positive but negative sentiment. In a future study, researchers should reexamine and refine the classification of YouTube comments to more precisely determine each comment's polarity. Advanced analytics, also known as predictive analytics, could be used to suggest the most popular YouTube comments as part of the suggested research. Advanced Analytics in future work can use some recommended software, including SAS, Oracle Data Mining, and SPSS, as tools for text mining research [24].

#### 5. CONCLUSION

After researching the videos of the three potential Indonesian presidential candidates, it is possible to conclude that they have more positive than negative sentiments, which has tested the study's hypothesis. The sentimental analysis result showed that Prabowo Subianto is the potential Indonesian presidential candidate with the highest percentage of positive sentiment compared to the other two presidential candidates, with 43.5%. This percentage is followed by Ganjar Pranowo and Anies Baswedan, with 42.5% and 39.7%, respectively. The three potential presidential candidates share similarities with the common appeared words, such as support and presidential candidate. The distinction between the three YouTube videos is that each has a different party name. This is understandable, given that various political parties support the three potential presidential candidates. Although there has been no indication of a proposal from Ganjar Pranowo's PDIP party, the name of the PDIP party and, surprise, the PPP party also appeared. Prabowo Subianto retains the name of his party, Gerindra, although Anies Baswedan's affiliation is the Nasional Demokrasi party. In this study, after employing the word cloud technique, researchers conducted additional analysis utilizing polarity. This technique examines sentiment analysis in further detail. This study determined that the public more frequently discussed Anies Baswedan. Because the researchers found some comments towards him in YouTube video comments about Ganjar Pranowo and Prabowo Subianto that should have negative sentiments toward one candidate. However, the meaning of the sentence was to support Anies Baswedan instead. This is understandable given the recent announcement by a national democrat that Anies Baswedan is actively campaigning to run for president. In the meantime, Prabowo Subianto is a figure who has contested elections in the past.

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