

TWITTER SENTIMENT ANALYSIS ON THE 2024 PRESIDENTIAL DISPUTE DECISION USING NAÏVE BAYES AND SVM

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Abstract

Public sentiment regarding the 2024 presidential election dispute decision was analyzed through the Twitter platform. The method employed was Naïve Bayes, implemented using RapidMiner software. The dataset consisted of thousands of tweets collected during the presidential election dispute period. Each tweet was classified into three sentiment categories: positive, negative, and neutral. The text mining process involved data cleaning, tokenization, and the application of natural language processing (NLP) techniques for feature extraction. The results of the analysis revealed the distribution of sentiments among Twitter users and changes in sentiment trends over specific periods. This research is expected to provide insights into public perceptions and sentiment patterns related to the presidential election dispute decision.

Keywords: Sentiment Analysis; Twitter; 2024 Presidential Election Dispute; Naïve Bayes; RapidMiner

Abstrak

Penelitian ini menganalisis sentimen publik terhadap keputusan sengketa pemilihan presiden 2024 melalui platform Twitter. Metode yang digunakan adalah Naïve Bayes yang diimplementasikan menggunakan perangkat lunak RapidMiner. Dataset yang digunakan terdiri dari ribuan tweet yang dikumpulkan selama periode sengketa pemilihan presiden. Setiap tweet diklasifikasikan menjadi tiga kategori sentimen: positif, negatif, dan netral. Proses text mining melibatkan pembersihan data, tokenisasi, dan penerapan teknik-teknik pengolahan bahasa alami (NLP) untuk ekstraksi fitur. Hasil analisis menunjukkan distribusi sentimen di antara pengguna Twitter serta perubahan tren sentimen selama periode waktu tertentu. Penelitian ini diharapkan dapat memberikan wawasan tentang persepsi publik dan pola sentimen terkait keputusan sengketa pemilihan presiden.

Kata kunci: Analisis Sentimen; Twitter; Sengketa Pemilihan Presiden 2024; Naïve Bayes; RapidMiner

INTRODUCTION

In today's digital era, social media has become a primary platform for people to express their views and opinions. One of the most popular social media platforms is Twitter, which is often used for public discussions on various issues, including politics. The sentiments expressed through tweets can provide valuable insights into public perspectives on specific issues. Sentiment analysis is a method used to identify and categorize opinions expressed in text through natural language processing (NLP) techniques and machine learning.

Previous research has extensively explored the use of sentiment analysis on Twitter for various topics. For example, (Zen et al., 2022)

analyzed sentiment related to Covid-19 on Twitter using various sentiment analysis techniques. (Naraswati et al., 2021) conducted a public sentiment analysis of Covid-19 handling policies in Indonesia using similar methods. Sentiment towards political issues has also been the focus of research, such as (Ruhyana, 2019) who analyzed sentiment towards the odd-even license plate policy in Jakarta.

In the context of presidential elections, sentiment analysis can be used to understand public reactions and opinions regarding election dispute decisions. By using analytical tools such as RapidMiner and the Naïve Bayes algorithm, this research aims to examine public sentiment toward the 2024 presidential election dispute decision as expressed on Twitter. The Naïve Bayes algorithm

was chosen for its simplicity and effectiveness in text classification, as demonstrated in previous research by (Putranti & Winarko, 2014) who applied it to Indonesian-language texts on Twitter.

This research is expected to contribute to understanding the dynamics of public opinion on social media and provide valuable insights for policymakers and political researchers. By understanding public sentiment, it is hoped that more appropriate actions can be taken in responding to emerging issues in society.

LITERATURE REVIEW

Sentiment analysis has become a highly popular method in social media research for measuring and interpreting public opinion. This study employs the Naïve Bayes algorithm within the RapidMiner application to analyze sentiments expressed on Twitter regarding the 2024 presidential election dispute decision.

A. Text Mining

Text mining is the process of extracting valuable information from unstructured text through natural language processing (NLP) techniques and statistical analysis. In sentiment analysis, text mining is used to identify and categorize opinions or sentiments expressed within the text. Text mining enables researchers to analyze large volumes of textual data generated from social media platforms such as Twitter, blogs, product reviews, and discussion forums (Pahtoni & Jati, 2024; Sandha et al., 2018; Sudiantoro & Zuliarso, 2018).

B. Sentiment Analysis

Sentiment analysis is the process of identifying and classifying opinions or sentiments expressed in text as positive, negative, or neutral. This method is used to understand individuals' feelings or attitudes toward a specific topic or product based on the texts they produce, such as tweets, reviews, comments, or blogs. For instance, sentiment analysis is utilized to measure public reactions to presidential election dispute decisions or other governmental policies (Berliana & Santoso, 2022; Vonega et al., 2022).

C. Data Scraping

Data scraping is the automated process of extracting information from websites. In the context of sentiment analysis, data scraping is typically performed to collect textual data from social media platforms such as Twitter. This process involves using tools or scripts to access web pages and extract relevant content. Data scraping enables researchers to collect large amounts of data quickly and efficiently (Alruily & Shahin, 2020; Sandryan et al., 2021; Taufiqi & Nugroho, 2023).

D. Twitter (X)

Twitter, a microblogging platform that allows users to post and read short messages known as "tweets," has become a highly valuable data source in sentiment analysis research. Twitter provides real-time access to public opinions on a wide range of topics, from current events to governmental policies. Due to its open and rapid nature, Twitter is often used to measure public reactions and opinions on specific issues (Saputra et al., 2021).

E. Case Folding

Case folding is the process of converting all letters in a text to lowercase. The aim of case folding is to reduce word variation caused by differences in uppercase and lowercase usage, so that "Analysis" and "analysis" are treated as the same word. This step is crucial for consistency in text processing and sentiment analysis (Aripiyanto et al., 2022; Fahmi et al., 2021; Saputra et al., 2021).

F. Tokenization

Tokenization is the process of breaking down text into smaller units called tokens, which are usually words or phrases. This process is essential for text analysis as it enables machine learning algorithms to work with smaller, more manageable text units. For example, the phrase "2024 presidential election" can be tokenized into ["2024", "presidential", "election"] (Audrey et al., 2022; Rai et al., 2021).

G. Punctuation Removal

This stage, part of data pre-processing, involves removing punctuation marks such as periods, commas, or symbols like exclamation points and question marks. Punctuation must be removed as it does not contribute meaningful

information for analysis (Kurniawan & Susanto, 2019; Pakpahan & Jasman Pardede, 2023).

H. Stopwords

Stopword removal is the process of eliminating common words that are considered to have little informative value or significant contribution to text analysis, such as “and,” “the,” “of,” “in,” and “to” in English or their equivalents in other languages. Removing stopwords helps reduce the number of irrelevant features in the text and improves the efficiency and accuracy of sentiment analysis (Fitriyah et al., 2020; Hartanto, 2017; Maulana & Darwis, 2025; Rezwanul et al., 2017).

I. Duplicate Removal

Duplicate removal is the process of eliminating redundant or repeated data entries from a dataset. In the context of sentiment analysis, removing duplicate tweets or reviews is essential to ensure that the analysis is not biased by repetitive data, thus yielding more accurate and representative results (Darmawan et al., 2022; Fremmuzar & Baita, 2023; Izzati, 2024).

J. RapidMiner

RapidMiner is a widely used data analysis tool in various research fields, including sentiment analysis. This platform provides robust support for data processing, data mining, and machine learning, offering a user-friendly interface with drag-and-drop features that facilitate the design of analysis processes (Putranti & Winarko, 2014).

K. Previous Research

A previous study titled “Sentiment Analysis of the Constitutional Court’s Decision Regarding the 2024 Presidential Election Dispute on X Social Media Using the Naïve Bayes Method” by Afifah Nurul Izzati focused on understanding public sentiment toward the Constitutional Court’s (MK) decision in resolving the 2024 presidential election dispute, as expressed on the X (formerly Twitter) platform. This study utilized the Naïve Bayes algorithm to analyze sentiments embedded within collected tweets. Data were collected through crawling techniques and then processed through several preprocessing stages, including case

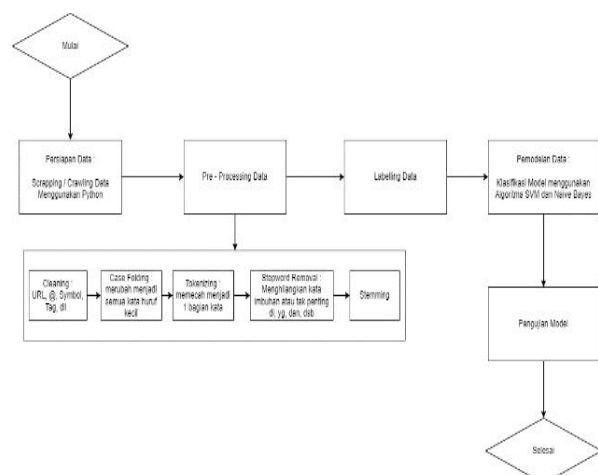
folding, cleaning, tokenizing, stopwords removal, and stemming.

From a total of 147 tweets obtained, 145 were used for further analysis. These data were classified into three sentiment categories: positive, neutral, and negative. The classification results showed that negative sentiment dominated, with 56 tweets, while positive sentiment accounted for 31 tweets, and neutral sentiment for 15 tweets. The study concluded that the majority of the public tended to have a negative view toward the Constitutional Court’s decision regarding the 2024 presidential election dispute, potentially influencing public trust in the institution.

The study also highlighted the analysis process, which involved data preparation, preprocessing, data labeling, classification using Naïve Bayes, and visualization of results. RapidMiner was employed to support the entire analytical process.

This research provides important insights into how sentiment analysis can reveal public opinion toward significant decisions. The findings can be utilized to understand the impact of the Constitutional Court’s decision on public trust and the democratic process in Indonesia.

By reviewing this previous study, it becomes evident that the methodology used is directly relevant to the current research. The use of the Naïve Bayes algorithm in the prior study provides a strong theoretical foundation, while the application of the Support Vector Machine (SVM) in the current study will expand the analytical approach. Furthermore, the use of the X platform as a data source and RapidMiner as an analytical tool reinforces the significance of these techniques and tools in understanding public opinion toward



critical institutional decisions.

Figure 1. Research Flowchart

RESEARCH METHODS

Data Collection

Data were collected from the social media platform Twitter using data scraping techniques. Tweets related to the 2024 presidential election dispute decision were gathered over a specific period, covering the phases before, during, and after the announcement of the decision. Data collection was carried out using the Twitter API or available scraping tools. The search criteria included relevant hashtags and keywords such as #PemilihanPresiden2024, #SengketaPemilu, #KeputusanPemilu, and others.

Data Pre-processing

The data collected through scraping were then processed to ensure quality and consistency. The preprocessing steps included:

- Case Folding:** All characters in the text were converted to lowercase to reduce variation caused by differences in letter casing.
- Duplicate Removal:** Duplicate tweets were removed to avoid bias in the analysis.
- Cleansing:** Data cleansing was performed by removing *special* characters, URLs, mentions (@username), hashtags (#), and irrelevant numbers.
- Tokenization:** The text was divided into smaller units called tokens, usually consisting of words or phrases.
- Stopword Removal:** Common, non-informative words (stopwords) were removed from the text. The list of stopwords was adjusted to fit the Indonesian language context.

Application of Naïve Bayes and SVM Algorithms

After preprocessing, the Naïve Bayes algorithm was applied for sentiment classification. The steps included:

a. **Dataset Splitting:** The dataset was divided into two parts, namely a training set and a testing set, with commonly used ratios such as 80:20 or 70:30.

b. **Model Training:** The Naïve Bayes and SVM algorithms were trained using the training set. The models learned the patterns and relationships between features (words in the tweets) and sentiment labels (positive, negative, neutral).

c. **Model Testing:** The trained models were then tested using the testing set to evaluate their performance. Evaluation methods included accuracy, precision, recall, and F1-score.

Result Analysis

The sentiment analysis results were examined to identify trends and patterns in sentiments toward the Constitutional Court's decision regarding the 2024 presidential election. Data visualizations were used to present the distribution of sentiments and sentiment changes throughout the data collection period.

RESULTS AND DISCUSSION

This study employed scraping techniques to collect tweet data from the social media platform X (formerly known as Twitter). Figure 2 below presents the syntax used to install several Python libraries required for this research.

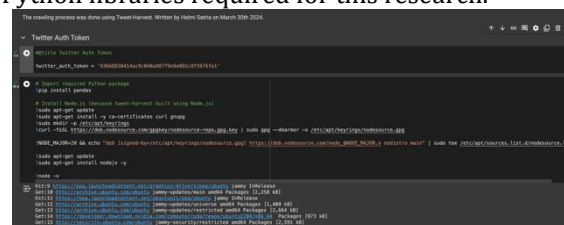


Figure 2. Installing and Importing Python Libraries

After installing the necessary Python libraries, the next step was to scrape data by entering the Twitter API Auth Token.

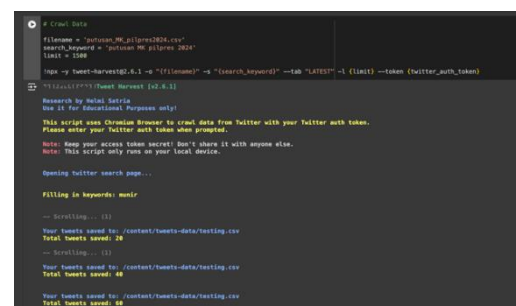


Figure 3. Initiating Data Collection Based on the Desired Topic

Conversation_id_str	Created_at	Search_text	Full_text	Id_str	Reply_text	Is_reply_to_text	Is_reply_to_id_str	Is_reply_to_user_id_str	Is_reply_to_username
1770000000000000000	2024-05-04 10:00:00	Presiden Jokowi	Presiden Jokowi adalah pemimpin yang terbaik untuk Indonesia.	1770000000000000000					
1770000000000000000	2024-05-04 10:00:00	Presiden Jokowi	Presiden Jokowi adalah pemimpin yang terbaik untuk Indonesia.	1770000000000000000					
1770000000000000000	2024-05-04 10:00:00	Presiden Jokowi	Presiden Jokowi adalah pemimpin yang terbaik untuk Indonesia.	1770000000000000000					
1770000000000000000	2024-05-04 10:00:00	Presiden Jokowi	Presiden Jokowi adalah pemimpin yang terbaik untuk Indonesia.	1770000000000000000					
1770000000000000000	2024-05-04 10:00:00	Presiden Jokowi	Presiden Jokowi adalah pemimpin yang terbaik untuk Indonesia.	1770000000000000000					

Figure 4. Scraping Results of Twitter Posts

The scraped data, as shown in Figure 4, consists of 11 attributes. Therefore, it was necessary to select only the attribute relevant to this study, namely the full_text attribute, as illustrated in Figure 5 below.

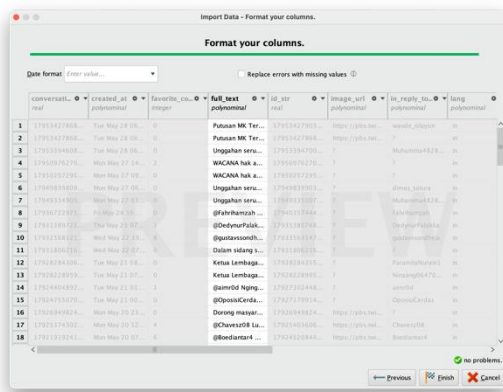


Figure 5. Feature Selection

Following the attribute selection, the next step was data preprocessing. This stage involved several processes, including case folding, tokenization, removal of punctuation, stopword removal, stemming, and duplicate removal, as presented in Figure 6.

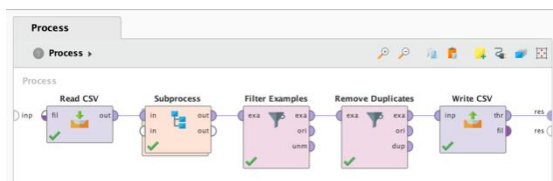


Figure 6. Data Preprocessing Stages

Subsequently, the data labeling process was performed manually using Microsoft Excel. Table show the results of installation of the Vader Sentiment library to assist in sentiment analysis.

full_text	Sentimen
Putusan MK Terkait Sengketa Pilpres Sudah Final dan Mengikat Serta Tidak Bisa Dibatalkan	Netral
Unggahan serupa juga diunggah oleh	Netral

pengacara Hotman Paris Pada sengketa Pilpres di Mahkamah Konstitusi lalu ia bertindak sebagai kuasa hukum Prabowo-Gibran	
WACANA hak angket untuk membongkar dugaan kecurangan Pemilu menguap begitu saja pascaputusan Mahkamah Konstitusi MK terkait sengketa hasil Pilpres	Negatif
dan kita pun juga harus bersyukur ketika ada putusan final di sengketa pilpres ini tidak ada huru hara atau bahkan sampai ada korban jiwa peserta yg kalah telah menunjukkan kedewasaannya dalam berpolitik	Positif
Gw pernah nantang lu dan semua yg mengaku menang dan yang menyidangkan sengketa Pilpres untuk ber Mubalah Kok ga lu jawab Takut kenak Kutuk Tuhan karena berbohong	Negatif
Prof Saldi Isra Hakim MK salah satu dari ketiga hakim yang tampil beda pendapat dengan lima hakim lainnya dalam memutuskan sengketa pilpres itu berasal dari Sumbang Rakyat sumbar kebanyakan memilih tapi orang ² yg dari sana memenangkan Rakyat jadi tumbal	Netral
Dalam sidang sengketa pilpres di Mahkamah konstitusi hakim sudah menjekaskan bahwa bansos yang di bagikan presiden	Netral

jokowi tidak ada hubungannya dengan pemenangan paslon manapun	
Ketua Lembaga Hikmah dan Kebijakan Publik PP Muhammadiyah Ridho Al-Hamdi mengatakan meski KPU sudah mengumumkan Prabowo sebagai pemenang Pilpres namun masih ada tahapan sengketa pemilu di Mahkamah Konstitusi MK	Netral
Ngingetin aja hasil Sengketa Pilpres MK Tolak Permohonan Paslon dan Jadi siap-siap kalau di Pilkada pun akan banyak yang pakai template pemenangan Pilpres kemarin	Negatif
Dia Sri Mulyani tipycal orang tdk berintegritas dan sdh merendahkan reputasi dan profesionalnya saat bersaksi di sidang sengketa pilpres Dia Sri Mulyani Sapa lg yg percaya omongan org yg Nir- integritas Liat tuh bawahan nya di pajak dan BC SULIT DIKENDALIKAN	Negatif
Dorong masyarakat agar bijak dalam menyikapi hasil putusan sidang sengketa Pilpres	Positif
Lu yakin menang tanpa ada kecurangan Kalau lu yakin biar gw jg yakin lu and kubu lu menang tanpa ada kecurangan gw tantang lu and kubu lu sekalian hakim MK yg menyidangkan sengketa Pilpres untuk ber Mubalahah Gw tunggu jawaban lu	Negatif

sesegera mungkin	
Dan yang mengaku menang tidak berani ber Mubalahah dan yg menyidangkan sengketa Pilpres tdk berani ber Mubalahah	Negatif
bulan jelang berakhirnya Jabatan Presiden Jokowi banyak kejutan yg dilakukan Pemerintah amp DPR dlm RUU Walau yg di Komisi III yg hadir sedikit Revisi UU MK pembalasan untuk tiga hakim yang menyatakan dissenting opinion pada sengketa Pilpres	Netral

Table 1. Manual Sentiment Labeling

After manually labeling the data via Excel, the following step was to build the model and prepare the training data, as shown in Figure 8.

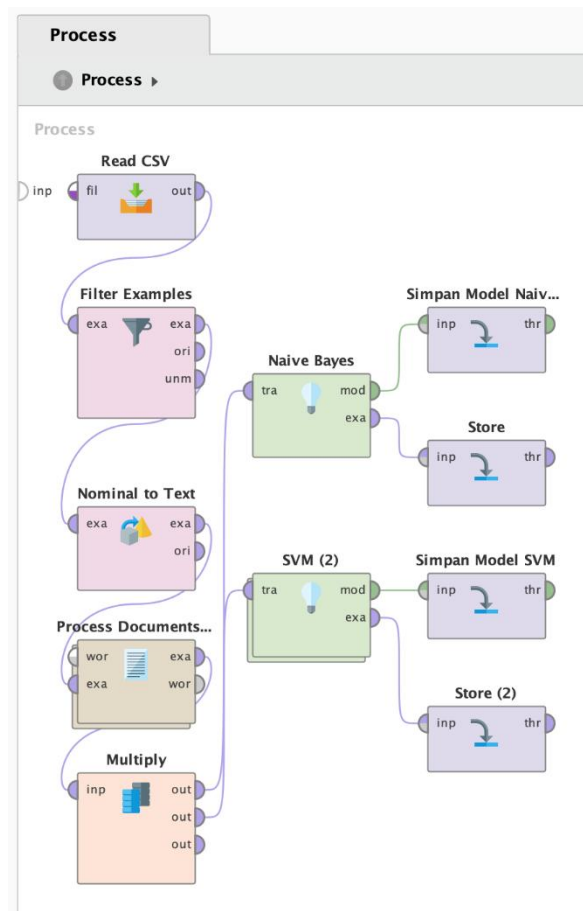


Figure 8. Model Construction and Data Training

The data modeling process was carried out by splitting the dataset into 70% training data and 30% testing data. Three algorithms were applied for classification: Naïve Bayes, Support Vector Machine (SVM), and Random Forest. The results of the model testing are shown in Figures 9, 10, and 11.

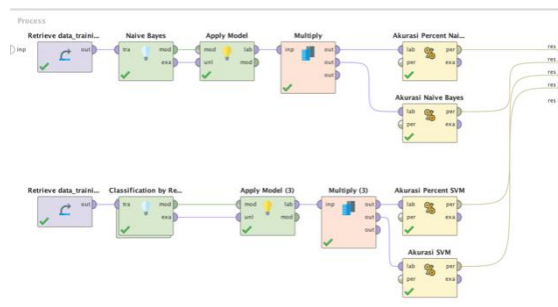


Figure 9. Model Testing Using Naïve Bayes and SVM

	true Negatif	true Negatif	true Positif	class precision
pred. Negatif	32	2	0	94.12%
pred. Negatif	0	21	0	100.00%
pred. Positif	0	0	16	100.00%
class recall	100.00%	91.30%	100.00%	

Figure 10. SVM Accuracy Results

accuracy: 98.59%

	true Negatif	true Negatif	true Positif	class precision
pred. Negatif	31	0	0	100.00%
pred. Negatif	0	23	0	100.00%
pred. Positif	1	0	16	94.12%
class recall	96.88%	100.00%	100.00%	

Figure 11. Naïve Bayes Accuracy Results

After successfully modeling the data, the final step involved visualizing the sentiment analysis results using a WordCloud, as illustrated in Figure 12.



Figure 12. Sentiment Text Visualization Using WordCloud

CONCLUSIONS AND SUGGESTIONS

Conclusion

This study analyzed Twitter users' sentiment towards the 2024 presidential election dispute decision by employing the Naïve Bayes and Support Vector Machine (SVM) algorithms using RapidMiner. The dataset consisted of 101 cleaned tweets, refined from an initial dataset of 309 tweets that contained numerous duplicates, tags, URLs, and other noise. The data were split into 71 training samples and 30 testing samples. The results showed that the Naïve Bayes algorithm achieved an accuracy of 98.59%, while the SVM algorithm achieved an accuracy of 97.18%. Naïve Bayes demonstrated superior performance in classifying sentiment compared to SVM on this dataset. These findings highlight the potential effectiveness of Naïve Bayes for political sentiment analysis on social media platforms.

Suggestion

Future researchers are encouraged to expand the dataset to include a larger and more diverse set of tweets in order to enhance the model's generalizability. Additionally, incorporating more advanced techniques such as deep learning models or ensemble methods could further improve sentiment classification performance. It is also recommended to apply real-time data collection and analysis to capture dynamic changes in public sentiment, especially in sensitive political contexts.

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