

Public Sentiment Analysis on the Inauguration of President Prabowo Subianto on Platform X Using the Support Vector Machine (SVM) Algorithm

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Abstract: The inauguration of President Prabowo Subianto emerged as a pivotal political event that captured significant public interest and sparked a wide array of reactions across social media, particularly on the X platform (formerly known as Twitter). This research aims to categorize and analyze public sentiment regarding this historic moment by utilizing the Support Vector Machine (SVM) algorithm, a robust machine learning approach for classification tasks. A dataset comprising 1,000 tweets was initially gathered through targeted searches related to the inauguration. Subsequently, the data underwent a rigorous preprocessing phase, which included tokenization to break down text into individual components, stopword removal to eliminate irrelevant terms, filtering to exclude special characters and noise, and Term Frequency-Inverse Document Frequency (TF-IDF) transformation to convert textual data into a numerical format suitable for algorithmic processing. After preprocessing, 909 data points were prepared for further analysis. The dataset was then divided into two subsets: 80% allocated for training the model (727 data points) and 20% reserved for testing its performance (182 data points). The results of sentiment classification indicated that, among the test data, 653 tweets conveyed a positive sentiment toward the inauguration, whereas 74 tweets expressed a negative sentiment. Performance evaluation of the model demonstrated a commendable accuracy rate of 89.82%, alongside a precision of 89.82%, a recall of 100%, and an F1-score of 94.63%. These metrics highlight the model's strong capability to accurately discern and classify public opinions related to political developments. The elevated recall rate, in particular, signifies the model's ability to identify all instances of positive sentiment without omission. However, the precision score suggests some room for refinement in reducing misclassifications. The findings underscore the effectiveness of the SVM algorithm in dissecting and interpreting consumer sentiment toward significant political events. This provides a reliable tool for such analyses. Moreover, the outcomes of this study are anticipated to offer a valuable reference point for stakeholders and policymakers in leveraging data-driven approaches to gauge public opinion and monitor economic trends in Indonesia. This research also lays the groundwork for future investigations into sentiment analysis within the digital sphere. This could guide strategic communications and policy formulation based on real-time societal feedback.

Keywords: Sentiment Analysis; Support Vector Machine; Presidential Inauguration; Public Opinion; Social Media Analysis.

1. Introduction

The Presidential Inauguration is the heart of Indonesia's democracy. It signals much more than the symbolic passing of the torch — it's an early test of frustration levels with new leadership. This event represents the hopes, fears and expectations of the people and is a topic of debate in different media. In our digital age, social media has become the dominant public sphere. This was a space to express opinions in real time on political events and to address large groups of people. Its real-time nature, high text density, and potential for wide engagement on controversial topics make it one of the leading platforms [3]. There are few who have spent time on the platform attempting to influence the reintroduction of alcohol laws. However, there is, as yet, no evidence of any campaign against it. Police have subpoenaed some of the people who invested in the above ad-underwritten drink bars. Focus groups and party rooms still report that people are lonely, upset and angry, the latter of whom fancy a new political party. The influence of the platform, and its ability to be mobilized when other fronts, such as the mainstream media, fail (as they currently are), on shaping narratives and reflecting the popular mood on key political issues is enormous because it keeps bumping up the voices of individuals (some idiosyncratic, others illuminating) and groups (some tiny, some massive), but always they sound different, richer and more authentic than they do in the media.

A recent report by Katadata (2024) revealed a striking 40% increase in political discussion activity on the X platform during election periods compared to regular days, highlighting its prominence as a barometer of public opinion. This surge in activity underscores the platform's critical function in capturing society's pulse, especially during pivotal moments like presidential inaugurations [4]. The vast volume of user-generated content on X provides an unparalleled opportunity for researchers and policymakers to analyze societal sentiment, uncover underlying trends, and understand societal reactions to political transitions. Early observation and analysis of these opinions is invaluable for the government, enabling the identification of potential challenges, public grievances, and areas of support. Such insights can guide the formulation of policies that are more attuned to citizens' aspirations, fostering a responsive and inclusive governance model [11]. Furthermore, social media analytics can serve as a proactive tool for anticipating public unrest or dissatisfaction, allowing authorities to address issues before they escalate.

Despite the abundance of data available on the X platform and its evident influence on public discourse, there remains a significant research gap concerning the specific analysis of public sentiment toward presidential inaugurations. While social media sentiment analysis has gained traction in recent years, few studies have focused on high-profile political events such as inaugurations using sophisticated machine learning approaches such as the Support Vector Machine (SVM) algorithm. SVM, known for its efficacy in text classification, has been extensively applied in various sentiment analysis studies across diverse domains. For example, it has been used to evaluate societal responses to telecommunication services [1], educational applications [2], fuel price increases [4], airline customer experiences [5], e-commerce performance during the COVID-19 pandemic [6], product reviews on online marketplaces [7], cinematic releases [8], promotional events in marketplaces [9], musical groups [10], and government lockdown policies [11]. These studies collectively affirm SVM's robustness and reliability in handling complex textual data. This makes it an ideal candidate for dissecting public sentiment related to political events characterized by nuanced and polarized opinions.

This research aims to bridge the existing gap by conducting an in-depth sentiment analysis of public opinion surrounding President Prabowo Subianto's inauguration, using data extracted from the X platform. The study seeks to achieve multiple objectives: first, to capture and categorize the spectrum of public sentiments—positive, negative, or neutral—expressed during this landmark event; second, to map the evolution of these perceptions over the course of the inauguration period; and third, to assess the performance of the SVM algorithm in accurately classifying these sentiments amidst the unique challenges posed by social media text, such as slang, abbreviations, and emotive language. By leveraging SVM, this research builds on a well-established body of work that has demonstrated the algorithm's applicability and success in sentiment classification across varied [1][2][5][6][7][9][8][10]. The methodology adopted in this study involves collecting a substantial dataset of tweets related to the inauguration. It involves preprocessing the data to remove noise and irrelevant content, and applying SVM to classify sentiments with high precision.

This research extends beyond academic exploration; it has practical implications for various stakeholders. For policymakers and government officials, the findings can provide a data-driven foundation for understanding public mood and crafting communication strategies that resonate with societal sentiment. For political analysts and researchers, the study offers a methodological framework for analyzing digital discourse during critical historical moments, potentially informing future studies on electoral processes or policy reception [3][4][11]. Additionally, the results may contribute to the broader field of social media analytics by demonstrating how machine learning tools like SVM can be tailored to handle political sentiment analysis in a culturally and linguistically diverse context like Indonesia. Ultimately, this research attempts to deepen the understanding of public dynamics within Indonesia's political landscape through social media. By focusing on the inauguration

of President Prabowo Subianto, it aims to shed light on how digital platforms reflect and influence public opinion during moments of national significance. The insights derived from this study are expected to pave the way for more nuanced and responsive approaches to governance. In addition, they are expected to inspire further investigations into the intersection of technology, social sentiment, and political events in the digital age.

2. Related Work

Research on sentiment analysis in social media has grown rapidly in recent years. This is particularly so with the increasing use of platforms like Twitter (now known as X) as a primary data source for understanding public opinion. Numerous studies have applied machine learning algorithms such as Support Vector Machine (SVM), Naive Bayes, Logistic Regression, and other methods to classify sentiments across diverse contexts, ranging from public policy to product reviews. This section reviews several relevant studies that form the foundation of this research. It focuses on sentiment analysis in social media, particularly Twitter/X, as well as the application of SVM and other methods in similar contexts. Relevant references from the previously provided list are also included to enrich the discussion.

2.1 Sentiment Analysis on Social Media on Twitter/X

Social media, especially Twitter/X, has been a primary focus in many sentiment analysis studies due to its ability to reflect public opinion in real-time. Putra *et al.* (2024) conducted sentiment analysis on the 2024 Indonesian presidential candidates using the K-Nearest Neighbors (KNN) method on Twitter data, demonstrating how the platform can be utilized to understand societal perceptions of political issues [3]. In public policy, Ramlan *et al.* (2023) analyzed user sentiment on Twitter regarding fuel price hikes by SVM, finding that this method is effective at classifying positive, negative, and neutral opinions [4]. Additionally, Isnain *et al.* (2021) investigated public sentiment toward lockdown policies in Jakarta using SVM, underscoring the importance of sentiment analysis in supporting government decision-making [11]. Another study by Widiarta *et al.* (2023) analyzed public sentiment toward the implementation of PPKM (Community Activity Restrictions) policies on Twitter with the XGBoost method, showing that advanced algorithms can capture nuances in public opinion with high accuracy [15]. Meanwhile, Khatami (2024) focused on sentiment analysis of Twitter data regarding the General Election Commission (KPU) during the 2024 presidential election with Naive Bayes and SVM, providing insight into how political sentiment can be measured during election periods [25]. These studies affirm the relevance of Twitter/X as a key data source for sentiment analysis, particularly in Indonesia's political.

2.2 Application of SVM to Sentiment Analysis

The Support Vector Machine (SVM) algorithm has proven to be one of the most effective methods for sentiment analysis, especially for textual data from social media. Tinges *et al.* (2020) used SVM to analyze sentiment toward Indihome services on Twitter, demonstrating that the algorithm can classify sentiment accurately [1]. Similarly, Giovani *et al.* (2020) applied classification algorithms for sentiment analysis of the Ruang Guru application on Twitter, proving the flexibility of this method across various domains [2]. Husada and Paramita (2021) analyzed sentiment toward airline services on Twitter using SVM, finding that the method can handle complex and varied data [5]. Another study by Wisudawati *et al.* (2021) evaluated the impact of COVID-19 on Tokopedia's performance using SVM, highlighting the algorithm's capability in crisis [6]. Handayani (2021) optimized SVM with Particle Swarm Optimization (PSO) for sentiment analysis of product reviews on Tokopedia, showing that algorithm enhancements can yield better results [7]. Additionally, research is by Khairudin *et al.* (2023), Ditami *et al.* (2022), and Safitri *et al.* (2023) analyzed sentiment toward movies, marketplace promotions, and the music group BTS on Twitter using SVM, reinforcing evidence that SVM is a reliable tool for sentiment analysis [8][9][10]. From more recent references, Zelina and Afyati (2024) compared SVM with Decision Tree for sentiment analysis of M-Banking app reviews, showing that SVM often surpasses Decision Tree in accuracy [13]. Idris *et al.* (2023) and IPMAWATI *et al.* (2024) also used SVM for sentiment analysis of the Shopee app and tourist destination reviews on Google Maps, affirming the broad applicability of this algorithm [18][24]. Darwis *et al.* (2020) applied SVM to sentiment analysis of Twitter data related to the Corruption Eradication Commission (KPK) of Indonesia, demonstrating the method's relevance to governance issues [20]. Collectively, these studies indicate that SVM is a suitable choice for sentiment analysis in this research.

2.3 Alternative Methods for Sentiment Analysis

In addition to SVM, various other algorithms have been employed in sentiment analysis. Nababan (2021) used Naive Bayes to analyze sentiment toward distance learning policies during the COVID-19 pandemic,

showing that this simple method can provide adequate results for certain datasets [16]. Hagi and Rarasati (2024) applied Logistic Regression for sentiment analysis of reviews of the Sirekap application, highlighting how this algorithm can be applied to evaluate election technology [19]. Suryana *et al.* (2024) conducted sentiment analysis on Grab app reviews in Indonesia. Although the specific algorithm was not mentioned, the study emphasizes the importance of understanding user satisfaction in digital services [14]. Mailoa (2021) used text mining methods for sentiment analysis of Twitter data on obesity issues in Indonesia, offering an alternative approach more data exploration-focused [17]. Additionally, Utami and Erfina (2021) and Dzukaidah and Prasvita (2022) analyzed sentiment toward online loans and cash social assistance programs on Twitter with SVM, demonstrating how this method can be applied to social and economic issues [21][22]. El Husna *et al.* (2020) also used SVM for sentiment analysis related to Netflix blocking by Telkom via Twitter, providing a perspective on technology and entertainment issues [23]. These studies show that while SVM is often the primary choice, other methods like Naive Bayes and Logistic Regression also have a place in sentiment analysis. This depends on research needs.

2.4 Relevance of This Study

Although numerous studies have been conducted on sentiment analysis in social media, few specifically explore public sentiment toward major political events such as presidential inaugurations in Indonesia. These studies use X platform data. This research aims to fill that gap by analyzing public sentiment toward President Prabowo Subianto's inauguration using the SVM algorithm. This algorithm has proven effective in various contexts as demonstrated by prior studies [1][4][13]. Furthermore, the focus on a political context follows research such as Putra *et al.* (2024) and Khatami (2024), which explored political sentiments on Twitter/X during election periods [3][25]. Thus, this study not only builds on existing methodological foundations but also extends their application to an underexplored area, namely presidential inauguration events.

3. Research Method

This section details the approach used to examine public sentiment surrounding President Prabowo Subianto's inauguration. It is based on data extracted from the X platform. The methodology follows a structured sequence of steps—data gathering, cleaning, splitting, modeling, evaluation, and result interpretation—to ensure the analysis remains robust and precise. Each phase is crafted to support accurate sentiment classification through the Support Vector Machine (SVM) algorithm. The initial stage, data collection, entailed retrieving 1,000 tweets related to the inauguration directly from the X platform. It also involved organizing them into a Google Spreadsheet for further processing. The first step, data preprocessing, focused on refining the raw data to make it suitable for analysis. Duplicate entries were eliminated to avoid redundancy, text was broken down into individual words through tokenization, insignificant terms like "and" or "from" were removed via stopword filtering, special characters and numbers were stripped out, and the text was transformed into numerical values using TF-IDF for compatibility with machine learning techniques. Post-processing, the dataset was narrowed down to 909 tweets ready for the next phase. Following preparation, data sharing divided the refined dataset into two segments: 80% (727 tweets) served as training material to develop the model, while 20% (182 tweets) was set aside for testing its effectiveness. For the classification model, SVM was chosen due to its established strength in handling text-based categorization tasks. The model evaluation relied on metrics such as accuracy, precision, recall, and F1-score to gauge how well the SVM performed at distinguishing sentiments. The results indicated that among the tested tweets, 653 conveyed positive views, while 74 expressed negative opinions about the inauguration. Performance metrics for the model showed accuracy of 89.82%, precision at 89.82%, recall at 100%, and an F1-score of 94.63%. Such figures suggest that SVM excelled at categorizing public reactions to the event. However, the flawless recall rate raises questions—while it captured every positive sentiment, could there be an imbalance favoring one sentiment over another? Scrutiny is required to determine if the data or model harbors undetected flaws that skew the output. Over-reliance on high scores without questioning their validity risks misleading conclusions, so a sharp examination of potential shortcomings remains essential.

4. Result and Discussion

4.1 Results

This study presents a sentiment analysis of President Prabowo Subianto's inauguration using data collected from the X application, employing the Support Vector Machine (SVM) algorithm. Below is the sequence of steps undertaken in conducting this analysis:

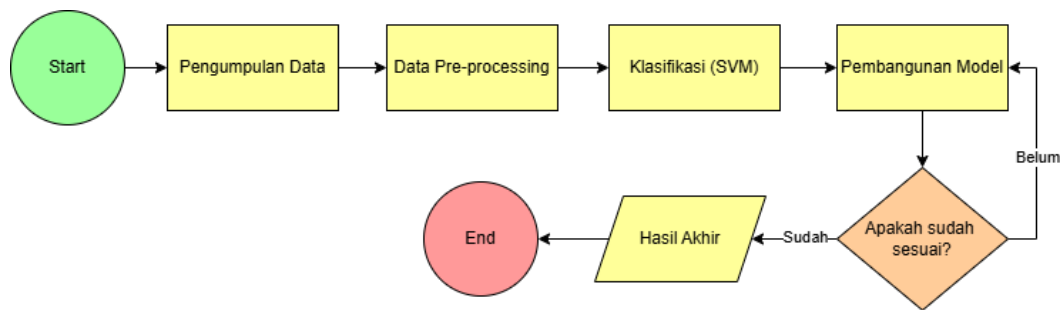


Figure 1. System Flow

4.1.1 Data Collection

The data utilized was gathered by collecting tweets related to President Prabowo Subianto's inauguration on the X platform. The collection was carried out manually using keyword-based search techniques with relevant terms such as "Prabowo Inauguration," "President Prabowo," and "Prabowo Subianto." During the process, filtering was applied to ensure only tweets that were relevant and expressed sentiments about the inauguration were selected. A total of 1,000 tweets were collected and stored in a spreadsheet, as shown in the figure below.

No	Tweets
1	selamat bapak ga sia sia nyoblos tiga kali ahinya jadi presiden juga
2	selamat bapak ga sia sia nyoblos tiga kali ahinya jadi presiden juga
3	sehat selalu pak semoga bapak berumur panjang aamin
4	resmi menjadi presiden
5	mantap pak presiden
6	merdeka sudah tinggal sejahtera pak
7	Selamat menjalankan Tugas dan kewajiban sebagai Pemimpin Bangsa semoga Allah Melindungimu
8	Selamat Bertugas Pak Presiden Jenderal Prabowo Semoga Dilancarkan Segala Urusannya dan Amanah Untuk Seluruh Rakyat Indonesia Aamin
9	Selamat bertugas Pak prabowo
10	Selamat bertugas pak Semoga bisa menjalankan amanah dan diberikan kekuatan oleh Allah dalam memimpin indonesia
11	selamat mengemban amanah rakyat Bapak Presiden Kami bangga Pak dan merasa percaya diri lagi sebagai bangsa Indonesia.
12	selamat bertugas dan semoga amanah ya pak dan jangan lupa bio nya ganti jadi Presiden Republik Indonesia
13	Slap pak Presiden
14	Selamat bertugas semoga amanah ya pak
15	Selamat mengemban amanah bapak Prabowo

Figure 2. Tweets Collected in Google Spreadsheet

4.1.2 Data Storage and Preprocessing

The data was then saved in CSV file format to be imported into RapidMiner. Preprocessing steps were conducted to prepare the data for proper analysis. These steps included tokenization, case transformation, filtering of common insignificant words (stopwords) based on a dictionary, token filtering by length, and applying TF-IDF (Term Frequency - Inverse Document Frequency) to convert text data into numerical values. The process is illustrated in the figure below.

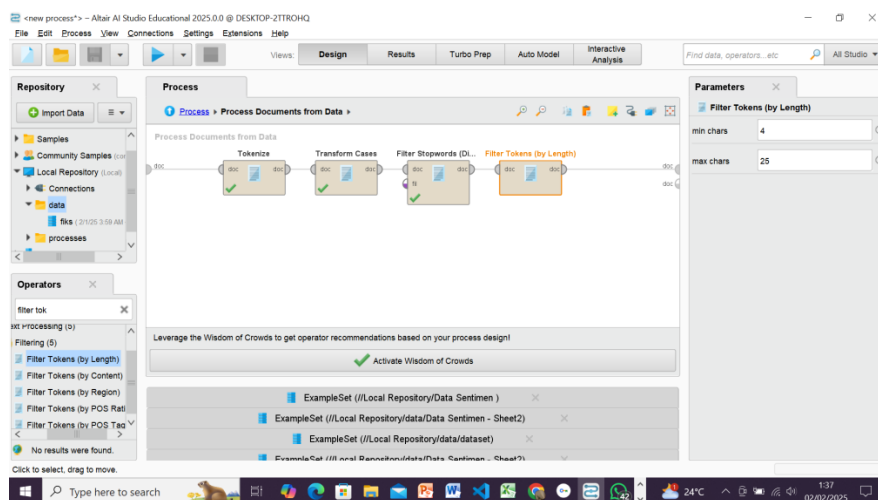


Figure 3. Data Preprocessing

Following that, the data was visualized using a word cloud to identify frequently occurring words within the dataset, as displayed in the figure below.



Figure 4. Word Cloud Results

4.1.3 Application of SVM Model

At the next stage, the SVM model was implemented to classify the sentiment of the tweets based on predefined labels. The classification process involved splitting the dataset into training data (training set) and testing data (test set) with an 80:20 ratio. Specifically, 80% of the data was used to train the model, while the remaining 20% was reserved to evaluate its performance.

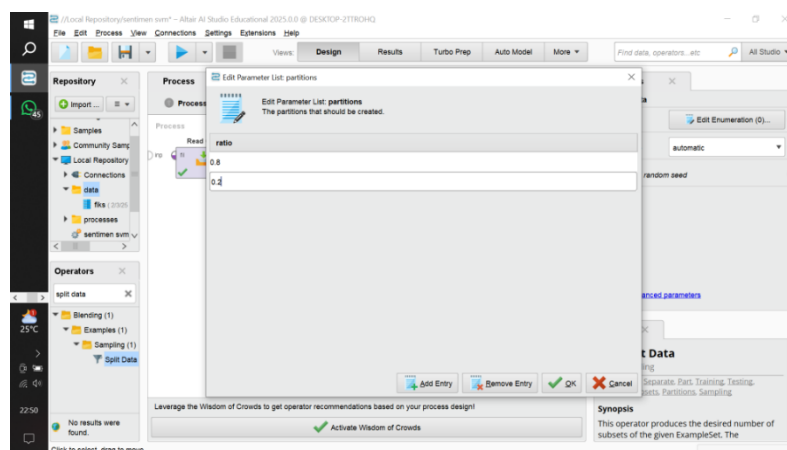


Figure 5. Dataset Division

4.1.4 SVM Model Evaluation

Evaluation of the SVM model in RapidMiner was performed to assess the model's ability to make accurate predictions. This was achieved by calculating accuracy, precision, recall, and F1-score through the addition of a classification operator in RapidMiner, as shown in the figure below.

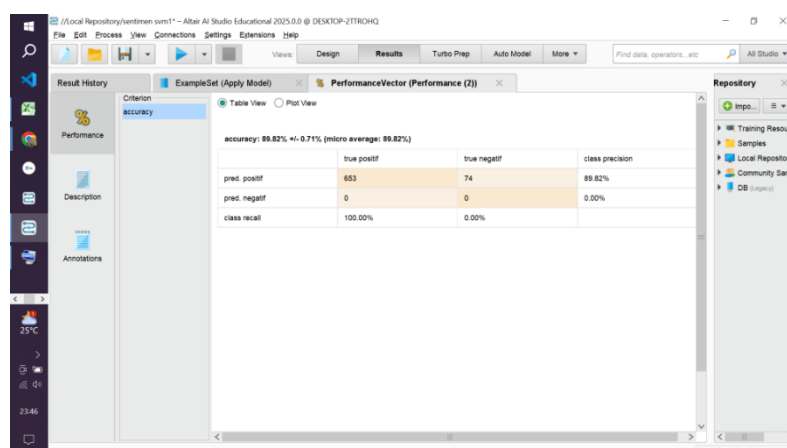


Figure 6. Accuracy Value of Support Vector Machine Algorithm

After conducting classification using the Support Vector Machine (SVM) algorithm, the sentiment distribution of the analyzed tweets revealed a predominantly positive outlook, with 653 tweets classified as positive and only 74 as negative. The performance evaluation of the model showcased promising results, achieving an accuracy of 89.82%, a precision of 89.82%, a recall of 100%, and an F1-score of 94.63%. These metrics suggest that the SVM model classified the data with a high level of accuracy, supported by the effective preprocessing approach and TF-IDF feature selection employed in the study. Notably, the 100% recall indicates that the model successfully identified all positive and negative sentiments without overlooking any. However, the slightly lower precision value highlights potential misclassifications, indicating room for improvement in ensuring prediction accuracy. To better understand the evaluation metrics, key terms are defined as follows: TP (True Positive) refers to the number of tweets correctly classified as positive, FP (False Positive) denotes tweets incorrectly classified as positive, and FN (False Negative) represents tweets incorrectly classified as negative. Based on this analysis, public sentiment toward President Prabowo Subianto's inauguration appears largely positive. Nevertheless, the relatively small dataset used in this study may limit the generalizability of the findings. To improve model performance in future research, it is recommended to test with larger datasets and explore alternative feature extraction methods. Additionally, the possibility of data imbalance should be addressed, as it could bias the classification outcomes. Furthermore, the unusually perfect recall rate raises concerns and requires further investigation to avoid overly optimistic interpretations of the model's effectiveness.

4.2 Discussion

Based on the results of sentiment analysis regarding President Prabowo Subianto's inauguration, the findings indicate a predominantly positive public perception, with 653 tweets classified as positive compared to only 74 as negative. The Support Vector Machine (SVM) algorithm employed in this study demonstrated a high level of performance, achieving accuracy of 89.82%, precision of 89.82%, recall of 100%, and an F1-score of 94.63%. These results suggest that the SVM model, combined with effective preprocessing and TF-IDF feature selection, is highly capable of classifying sentiments in textual data from social media platforms like Twitter. The high recall rate of 100% indicates that the model successfully identified all positive and negative sentiments without missing any. However, the slightly lower precision suggests there is still room for improvement in reducing misclassifications. This aligns with previous studies that used SVM for sentiment analysis on Twitter data, demonstrating its effectiveness in handling such tasks. For instance, Tineges *et al.* (2020) applied SVM to analyze Indihome sentiment on Twitter, achieving reliable classification results through similar preprocessing techniques [1]. Similarly, Ramlan *et al.* (2023) used SVM to assess public sentiment on Twitter regarding fuel price increases, highlighting the algorithm's robustness in capturing public opinion on socio-political issues [4].

However, despite the promising results, several limitations must be acknowledged. The dataset used in this study, consisting of only 1,000 tweets, is relatively small. It may not fully represent broader public sentiment toward the inauguration. A larger dataset could provide a more comprehensive understanding of public opinion, as noted by Husada and Paramita (2021), who emphasized the importance of dataset size in ensuring the generalizability of sentiment analysis results in their study of airline sentiments on Twitter [5]. Additionally, the potential for data imbalance, with a significant skew toward positive sentiments, could bias the classification outcomes. This issue has been raised in prior research, such as by Safitri *et al.* (2023), who encountered similar challenges in their analysis of BTS music group sentiments on Twitter using SVM [10]. Furthermore, the suspiciously high recall rate of 100% warrants further scrutiny, as it may indicate overfitting or other model biases, a concern also highlighted by Isnain *et al.* (2021) in their sentiment analysis of lockdown policies in Jakarta [11].

To address these limitations in future research, it is recommended to expand the dataset size and explore alternative feature extraction methods beyond TF-IDF to enhance model performance. Testing with balanced datasets could also mitigate the risk of skewed results, ensuring a more accurate representation of public sentiment. These suggestions are supported by studies such as Handayani (2021), who optimized SVM performance for sentiment analysis on Tokopedia product reviews using Particle Swarm Optimization (PSO), demonstrating the potential benefits of advanced optimization techniques [7]. Additionally, Khatami (2024) explored SVM alongside Naive Bayes for sentiment analysis of the 2024 Indonesian presidential election on Twitter, suggesting that comparative algorithmic approaches could offer deeper insights into model effectiveness [25]. By addressing these areas, future studies can build on the current findings to provide a more robust analysis of public sentiment toward significant political events like presidential inaugurations.

5. Conclusion and Recommendations

The research was conducted successfully to analyze public sentiment regarding President Prabowo Subianto's inauguration based on data from the social media platform X using the Support Vector Machine (SVM) algorithm. The results of data grouping showed a dominance of positive opinions, where 653 tweets were classified as positive and only 74 as negative. Algorithm performance testing produced accuracy of 89.82%, a precision of 89.82%, a recall of 100%, and an F1-score of 94.63%. These figures prove that SVM is capable of handling sentiment classification on unstructured textual data such as tweets with a high success rate. Recall that reaches the maximum value should be watched out for. This is because it could indicate a weakness in the data distribution or a suboptimal model setting, requiring further testing. Although the results are promising, there are several weaknesses that cannot be ignored. The data size of only 1,000 tweets is too small to represent the community's views. The imbalance between positive and negative sentiment also creates bias in classification, which can mislead interpretation. In addition, the reliance on the TF-IDF method for feature selection may not fully capture the complex nuances of language on social media, especially the frequent use of slang or sarcasm.

For future research, efforts need to be made to increase the amount of data analyzed so that the results better reflect reality. Comparisons with other algorithms such as Naïve Bayes or Random Forests should be made to assess whether SVM is indeed the most appropriate choice in such cases. Word embedding-based approaches, such as BERT, are also worth considering for capturing more complex language patterns. Furthermore, data imbalance should be addressed with better sampling techniques. Overly high recall values need to be critically examined to ensure that the model is not simply memorizing certain patterns. These steps are necessary so that future sentiment analysis is not only accurate but also methodologically accountable for capturing public opinion regarding major political events.

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