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Classification Sentiment Toward the Indonesian National Soccer Team on Twitter Using Text Mining Transformation

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ABSTRACT

People now primarily use social media, particularly Twitter, to share their thoughts, feelings, and reactions to events, including in sports like soccer. By gathering information from the official Twitter account @TimnasIndonesia during the World Cup qualifying phase, this study seeks to examine how the public views the Indonesian national team. The Support Vector Machine (SVM) approach was used to classify 412 tweets after they had undergone text pre-processing steps such as data cleaning and text transformation. Three sentiment categories were employed: good, negative, and neutral. With a percentage of 76.7%, neutral sentiment is the most prevalent sentiment, followed by positive sentiment (17.0%) and negative sentiment (6.3%), according to the classification results. With a precision of 0.83 and a recall of 1.00, the neutral category outperformed the others, according to the model evaluation. The model's overall accuracy rate of 83% indicates how successful the strategy is. Still, there are issues with categorizing positive and negative emotions. There are still a lot of positive tweets that go undetected since positive emotion has a very low recall (0.18) and a high precision (1.00). Thus, it is advised that future studies concentrate on developing more representative text features and enhancing the classification performance of minority categories using methods like oversampling, undersampling, or class weight adjustment. This will help to balance the data distribution and enable the model to classify all sentiment categories more accurately.

INTRODUCTION

Social media, especially Twitter, has become an important tool for people to express their opinions and feelings on various topics, including sports. In soccer, Twitter gives fans the opportunity to share their criticism, euphoria, and hopes for the Indonesian National Team. The joy that arises after a match or during a tournament can show how people feel about their national team's victories or failures (Prajamukti & Mega Santoni, 2021a). The Indonesian National Team (Timnas) is a symbol of national pride in Indonesia, and soccer is the most popular sport in the country. The euphoria that arises from Timnas matches, whether they win or lose, reflects the spirit and hopes of the people. Twitter has become the primary platform for users to express their opinions and reactions to various sports events. With a large user base, Twitter provides rich real-time data for analysis. Through sentiment analysis on Twitter, researchers can collect information about public opinion directly, which is highly relevant for understanding the dynamics of support for the Indonesian National Team (Juniardi & Sugianto, 2024).

Sentiment analysis extracts and understands opinions from texts created by social media users. This analysis can categorize tweets into positive, negative, or neutral categories using text mining techniques. This analysis allows us to identify patterns of support and criticism that emerge among fans, as well as how public perception of the team can be influenced by this (Muzaki et al., 2024). This study is meant to analyze how excited Indonesians are about their national team using Twitter data. By using text mining transformation, this study aims to give a clearer picture of how people respond to the Indonesian national team's performance in different competitions.

Text mining transformation techniques are needed to handle text data more accurately and efficiently. These techniques categorize sentiment into positive, negative, and neutral categories, in addition to helping with data organization and cleaning. Support Vector Machine (SVM) a supervised learning technique that effectively divides data into different groups by identifying the optimal hyperplane, is one of the strategies used in this classification process. As SVM can handle high-dimensional data, including word characteristics in text documents, it is often used in text analysis. To obtain more organized and reliable classification findings, SVM is used in this study to classify public opinion based on specific key phrases that indicate sentiment patterns.

Sports teams and team management decision makers can learn a lot from the findings of the analysis. The purpose of text mining transformation techniques is to efficiently handle and examine large amounts of textual data. This is especially true in the case of sentiment analysis, particularly from Twitter and other social media sites. Text mining transformation enables the automation of data processing from collection to analysis. This reduces the time and

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effort required for manual data analysis. Management teams can take swift action by understanding how the public responds to a particular game or event thanks to the ability to process data in real-time.

Sentiment analysis can provide insight into how the team's performance is perceived by the public. Through accurate and efficient sentiment analysis, decision-makers in the world of sports can make better strategic decisions, improve relationships with fans, and drive the team's performance in a more positive direction. Stakeholders can evaluate training and communication strategies and enhance the audience experience in the future by understanding how the public views the team's performance. Additionally, this research can assist in developing new strategies to enhance public support for the national team. It is anticipated that this study will make a significant contribution to understanding the dynamics of public support for the Indonesian national team through Twitter data analysis.

LITERATURE REVIEW

R. Prajamukti dan M. Mega Santoni (Prajamukti & Mega Santoni, 2021a) conducted research on Classification and Sentiment Analysis on Twitter data to examine public opinion about the Indonesian National Football Team. This research used the Naive Bayes algorithm, with an accuracy value of 83%, a precision value of 78%, and a specificity value of 87.5%, showing that the algorithm is very effective in classifying positive and negative sentiments.

Research written by M. I. Al Anbari (Al Anbari, n.d.) Using the Naïve Bayes method, we investigated the level of public satisfaction with the Indonesian national football team on Twitter. The results show that 71% of the data analyzed had neutral sentiment, 16% had positive sentiment, and 11% had negative sentiment.

Sentiment Analysis of the U-17 World Cup from Twitter Users According to research done by M. Kholilullah, Martanto, dan U. Hayati (Kholilullah et al., 2024), The Naïve Bayes method can achieve up to 97% accuracy in sentiment analysis, and most of the data analyzed shows positive sentiment toward the U-17 World Cup taking place in Indonesia.

Research conducted by Y. Akbar, A. Nur Ihsan, dan S. (Akbar et al., 2023) using the SVM algorithm to analyze public opinion about the 2023 SEA Games in Cambodia. The results of the analysis show that the event has an accuracy rate of 92.08%, which provides an important insight into public opinion about the event. better than the data.

Using the K-Nearest Neighbors (K-NN) method, Aditya, Atik, dan Grace (Pratama et al., 2022a) Analyzing public opinion toward the Indonesian National Team during the 2020 AFF Cup had an accuracy rate of 67.49%. A total of 50% of tweets had positive emotions, while the remaining 49% had negative sentiments, based on an analysis of 22,182 tweet data. This is in line with research carried out by Jeremy, Tresna, and Aryo.(Septian et al., 2019) Using TF-IDF weighting and K-Nearest Neighbor from 2000 data points showed results of 790 positive tweets and 1,210 negative tweets with an accuracy of 79.99%.

Research by I Made, Viktor dan Putu Bagus (Made et al., 2024) Using the IndoBERT method showed an accuracy of 97.58%. The results of the study showed a dominance of positive sentiment at 74.9% with the main emotions being trust and joy. There were also negative emotions such as anger and fear.

Using the Support Vector Machine method Maulana, Danang dan M. Risky (Malik et al., 2024) analyzing the results of the Indonesian national football team's matches in the U23 Asian Cup on YouTube. Using 40% of the test data yielded an accuracy of 63.40%, while using 60% of the test data yielded an accuracy of 63.76%. The analysis produced frequently occurring words such as “lost,” “Garuda,” “national team,” and “Indonesia.”

Theoretical Foundation

1. Indonesian National Team

Soccer is a sport that is popular among Indonesians. This can be seen in the demand among Indonesians, especially for soccer. Both children and adults are very enthusiastic about discussing soccer (Mudzakir & Widodo, 2022). The Indonesian National Team (Timnas) is the pride of Indonesian soccer. In this country, soccer is the most popular sport, and the national team's performances often attract public attention. The public's enthusiasm for the National Team can be measured by examining sentiment on social media, particularly Twitter, where fans share criticism, hopes, and support after matches (Pratama et al., 2022b). Soccer is the most popular sport worldwide. No other popular culture can unite people across the globe in the history of sports like soccer does (Irwanda et al., 2025).

2. Twitter

The high level of community engagement in discussions about soccer on Twitter shows that this platform functions not only as a means of communication but also as a space for fans to engage in dialogue about their favorite teams. The sentiments expressed on Twitter can create wider social buzz about certain issues in Indonesian soccer. (Prajamukti & Mega Santoni, 2021b). Through sentiment analysis techniques, data from tweets can be categorized into positive, negative, or neutral sentiments. This enables decision makers in the world of sports to understand public perceptions and formulate more effective communication strategies (Jasmiati & Al Islami, 2024).

3. Sentiment Analysis

Opinion mining or sentiment analysis is a field of data mining that is useful for analyzing, processing, and extracting textual data on entities such as services, products, individuals, organizations, events, or specific issues and topics (Kevin et al., 2020).

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Sentiment analysis is the process of determining the attitude or opinion contained in a text, usually in the context of social media. The main purpose of sentiment analysis is to extract useful information from various data sources by identifying whether the sentiment contained in the text is positive, negative, or neutral. This process often involves natural language processing (NLP) and machine learning techniques to classify text into appropriate sentiment categories. Common steps in sentiment analysis include text preprocessing, text representation, and sentiment classification (Luthfiansyah & Wasito, n.d.).

Sentiment analysis is a study related to computing associated with the opinions, emotions, or comments of a person or community when responding to an event that can be expressed in text form. Sentiment analysis is capable of converting unstructured data into structured data (Natasuwarna, 2020).

4. Transformation Text Mining

Text mining is an applied concept in data mining to find patterns in text. The purpose of text mining is to obtain and utilize information contained in the text. Text data often contains irregularities in words, both affixes and figurative language (Fadhilah, 2022).

Text mining is the process of analyzing and extracting information from unstructured text data, which is increasingly important in today's information age. This process involves several stages, including text transformation, which serves to convert text data into a more structured format that is ready for analysis. In text transformation, steps such as case folding, tokenization, stopword removal, as well as stemming and lemmatization techniques are applied to prepare the data for easier processing. By converting unstructured data into a structured format, researchers can apply machine learning algorithms and other analytical techniques to gain better insights from the data (Mauliza & Sipayung, 2024).

5. Support Vector Machine

Definition Support Vector Machine (SVM) is a learning system that uses a hypothesis space in the form of linear functions in a high-dimensional feature and is trained using a learning algorithm based on optimization theory. Support Vector Machine (SVM) was introduced by Vapnik, Boser, and Guyon in 1992 as a series of leading concepts in the field of pattern recognition (Sugara & Subekti, 2019).

The accuracy level of the model that will be produced by the transition process with SVM is highly dependent on the kernel function and parameters used (Monika Parapat & Tanzil Furqon, 2018). The basic concept of the SVM algorithm is to find the optimal hyperplane. A hyperplane is a function that serves as a separator between data (Rahman et al., 2021). SVM attempts to find the hyperplane that best separates tweet data into negative, neutral, and positive sentiments. SVM has two important types of hyperplanes: linear hyperplanes and non-linear hyperplanes. If the data can be perfectly separated by a linear hyperplane, SVM is referred to as linear SVM. However, if the data cannot be perfectly separated linearly, SVM uses kernel transformation techniques to transform the data into higher feature dimensions, where a linear hyperplane can be created. By using various types of kernel functions, such as linear kernel, polynomial kernel, or Gaussian kernel, SVM can efficiently handle data with non-linear characteristics. A kernel function is a function that transforms data into higher dimensions with the aim of improving data structure to facilitate the separation process (Rabbani et al., 2023).

In this case, the general formula for linear SVM can be written as follows (Rabbani et al., 2023):

$$f(x) = sign\,(w.x + b) \qquad (1)$$

Where f(x) is the prediction function, w is the normal vector hyperplane, x is the input feature vector, and b is the bias or intercept (Rabbani et al., 2023).

METHOD

Problem Identification

This study examines how people use social media, particularly Twitter, to respond to the performance of the Indonesian national team. Measuring and analyzing public perceptions of the national team's performance in soccer matches is the main issue to be discussed. In addition, the purpose of this study is to identify patterns of sentiment that emerge in comments and tweets about the Indonesian national team. Furthermore, this study will investigate how text mining transformation methods can be used to analyze this data.

Data Collecting

Data collection was carried out using the Twitter API to retrieve relevant tweets. To ensure the relevance of the analysis, data collection will be limited to a specific time frame, such as one month before and after an important match. In addition, only tweets from real users will be considered, and tweets from bot accounts or irrelevant accounts will be ignored. To ensure the representativeness and accuracy of the analysis, this study aims to collect at least 1,000 tweets.

Pre-Processing

Before using the Support Vector Machine (SVM) algorithm to train the classification model, the preprocessing step in this study attempts to clean and prepare the text data. Special characters, URLs, punctuation marks, and numbers that have no semantic meaning in the context of sentiment analysis are removed first in this process. Following that, all

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text is converted to lowercase, and frequently occurring terms such as “and,” “which,” “or,” and so on, which lack significant meaning, are removed. To standardize words with the same meaning but varying forms, the text is then converted into its base form (stemming). The Term Frequency-Inverse Document Frequency (TF-IDF) technique is then used to convert the text data into a numerical representation to prepare it for the classification model. By reducing the amount of noise in the data, this step can improve the quality and accuracy of the modeling.

Data Analysis Method

The Support Vector Machine (SVM) algorithm, a supervised learning technique, is used to analyze data after preprocessing and conversion to TF-IDF vector form. Finding the optimal hyperplane to divide the data into three sentiment classes—positive, negative, and neutral—is how SVM works. The three categories were classified in this study using a multi-class method and the One-vs-Rest (OvR) strategy.

Tweet data about the Indonesian National Team labeled with sentiment using keywords was used to train the model. Based on the evaluation results, SVM can categorize tweets with an accuracy of 83%; the neutral category showed the best performance (precision 0.83, recall 1.00, f1-score 0.91). Due to the relatively small amount of data for the negative category, this category was not classified well, while the positive category produced excellent precision (1.00) but low recall (0.18). This indicates that although data balancing or addition is needed to improve the classification performance of minority groups, the SVM model is quite effective in identifying neutral public opinion toward the National Team.

Through the Twitter social media network, this investigation highlights how Indonesian society reacts to the performance and naturalization policies of the country's national team members. Although there is less open criticism and support, most tweets are neutral, reflecting an informed or unemotional point of view. These sentiment patterns were successfully identified by the SVM model.

Data Results

The results of the sentiment analysis will be presented in the form of data visualizations, such as graphs or bar charts showing the proportion of positive, negative, and neutral sentiments from all tweets analyzed. In addition, emerging sentiment patterns will be studied to show how the public responds to the performance of the Indonesian National Team. It is hoped that these findings can be used by team management to build better relationships with fans and develop more effective communication strategies.

Conclusion

The Support Vector Machine (SVM) algorithm was used in this study to categorize public opinion regarding the performance of the Indonesian National Team based on comments found on Twitter. The SVM algorithm was chosen because, with labeled data, this algorithm can clearly distinguish sentiment classifications. The results of the study show that the SVM model performs well in categorization, especially in the neutral sentiment category, which dominates public opinion. This study shows that, regardless of whether the National Team wins or loses, most people have opinions about them that are generally informative or emotionally neutral. However, the categorization results in the positive and negative categories are still below standard, indicating that data distribution and labeling techniques need to be improved. Overall, the SVM analysis confirms that supervised learning techniques like SVM are successful in evaluating sentiment on social media and provide valuable insights into how the general public views the Indonesian national team and policies like player naturalization.

RESULT

The data used in this study, which focuses on the period during which the Indonesian national team qualified for the World Cup, was collected by crawling Twitter. As a result, 412 tweets were collected. An accuracy rate of 83% was obtained after conducting sentiment analysis using Support Vector Machine (SVM), indicating a high level of accuracy in identifying public sentiment.

Table 1. Some Sentiment Analysis Results

Full Tweet	Clean Tweet	Sentiment
kata nya pemain timnas vietnam 1 ini lagi gacor di aff 2024 #indonesia #wedebola #shorts #shortsvideo #shortsyoutube #shortsviral #shortvideos #shortsvideo https://t.co/oAUzS6X7vB	kata nya pemain timnas vietnam ini lagi gacor di aff indonesia wedebola shorts shortsvideo shortsyoutube shortsviral shortvideos shortsvideo tcooAUzSXvB	Neutral
Lumayan klo nanti timnas PSSI gagal lolos ke Piala Dunia 2026 prestasi pak de bisa jadi pelipur lara	Lumayan klo nanti timnas PSSI gagal lolos ke Piala Dunia prestasi pak de bisa jadi pelipur lara	Negative
emang bagus aslinya asnawi ini di port maen pakem 4 bek di timnas balik jadi rwb	emang bagus aslinya asnawi ini di port maen pakem bek di timnas balik jadi rwb seperti ada	Neutral

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seperti ada sesuatu yg kosong	sesuatu yg kosong	
Janji Shin Tae Yong di Tahun 2025 #shintaeyong #timnas #timnasindonesia https://t.co/02nWZmaeoq	Janji Shin Tae Yong di Tahun shintaeyong timnas timnasindonesia tconWZmaeoq	Neutral
@Anonnym77843904 Wkwkwkw miskin tapi bisa punya pemain timnas sama penonton paling banyak loh x yang miskin	Anonnym Wkwkwkw miskin tapi bisa punya pemain timnas sama penonton paling banyak loh x yang miskin	Neutral
2025 tahun pentuh tantangan bagi Timnas semua kategori untuk mencetak prestasi bersejarah bagi sepakbola Indonesia https://t.co/niL02Oe4Nm https://t.co/37jTcS2GRD	tahun pentuh tantangan bagi Timnas semua kategori untuk mencetak prestasi bersejarah bagi sepakbola Indonesia tconiLOeNm tcojTcS2GRD	Neutral
@punditgagal Semoga makin gacor aja ya Timnas. Aku bangga ama kalian	punditgagal Semoga makin gacor aja ya Timnas. Aku bangga ama kalian	Positive
@punditgagal Semangat truss yahh Timnas	punditgagal Semangat truss yahh Timnas	Positive
@punditgagal Makin bagus semoga ni timnas	punditgagal Makin bagus semoga ni timnas	Positive
Terimakasih sudah melenggang di timnas arab Saudi	Terimakasih sudah melenggang di timnas arab Saudi	Neutral

This table shows the results of sentiment classification from tweets collected by the Indonesian national team during the World Cup qualifying tournament. Based on several analysis results, most tweets express neutral views, such as those related to the coach's promises, funny comments made by internet users, or general comments about the players. Only a few are classified as positive, including words of encouragement or aspirations for the national team's success. There are not many negative tweets, such as “PSI failed to qualify for the World Cup,” which express sadness or dissatisfaction. Based on this classification, most Twitter users mostly share facts or humorous jokes that are neither overly positive nor negative.

DISCUSSION

This pie chart shows the sentiment distribution of each tweet after undergoing Support Vector Machine (SVM) analysis. Based on the classification results, only 6.3% of tweets were classified as negative, 17.0% as positive, and 76.7% as neutral. This indicates that the majority of Twitter users discussing the Indonesian National Team throughout the World Cup qualifiers tend to provide neutral and informative perspectives, such as sharing match updates, score notifications, or simply reposting news without expressing personal opinions.

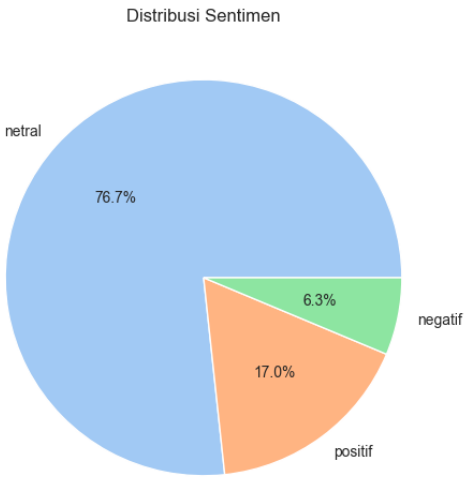

Fig. 1 Results of Sentiment Distribution of Indonesian National Team Tweets

There are still relatively few emotional statements, whether in the form of praise (positive) or disappointment (negative), as evidenced by the dominance of neutral moods. The fact that many people simply repeat information from official accounts or the media without adding their own subjective assessments may be one of the reasons for this. Meanwhile, the relatively large proportion of positive opinions (17.0%) indicates that the public has strong support for the national team's performance, especially when the team performs well or wins. However, the low number of negative

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emotions (6.3%) suggests that the public is hesitant to voice their dissatisfaction in public spaces like Twitter, and criticism or dissatisfaction with the team's performance has not been dominant so far. The public's tendency to be indifferent when discussing the national team is reflected in this sentiment distribution pattern, although they occasionally express positive enthusiasm during proud moments.

The absolute number of tweets for each sentiment category is shown in the bar chart. With 316 tweets in total, the neutral category is the most numerous. Only 26 tweets were categorized as negative, 70 as positive, and 70 as neutral. This distribution aligns with the results of the previous pie chart, which also showed how neutral sentiment dominates public Twitter discussions. The number of neutral tweets far exceeds the number of positive and negative tweets, indicating a significant imbalance in distribution across all emotional categories.

People continue to support and express gratitude for the national team's performance, especially when the team performs well or wins, as evidenced by the large number of supportive tweets. The fact that there were only 26 unpleasant tweets shows that, although there is criticism of the team, it is not widespread. This may reflect a mindset that prefers to show support or remain neutral rather than openly condemn.

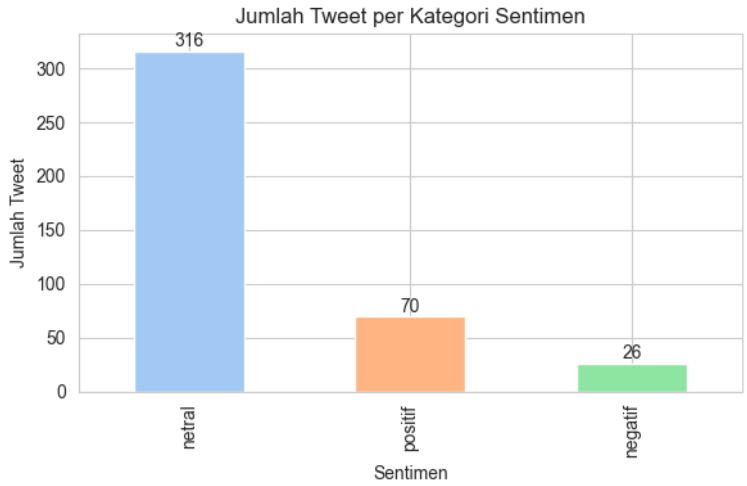

Fig. 2 Number of Tweets per Sentiment Category

In numerical form, this bar chart is very helpful in providing a clear picture of the volume of sentiment or public opinion. According to the interpretation, the dominance of neutral attitudes indicates that the majority of respondents did not openly express their emotional opinions, whether criticism or support. This may be because the majority of tweets only contain neutral content such as match scores and result updates.

CONCLUSION

The majority of Indonesians expressed neutral sentiments toward the Indonesian national team's performance during the World Cup qualifiers, based on sentiment classification results using the Support Vector Machine (SVM) algorithm. A total of 76.7% of the 412 tweets categorized as neutral reflected this sentiment. In contrast, only 6.3% expressed negative sentiments and 17.0% expressed positive sentiments.

The dominance of neutral sentiment indicates that the majority of Twitter users' opinions are descriptive, educational, or lack significant emotional content. This may be because many tweets contain news, match scores, or objective stories. However, the relatively high percentage of positive emotions suggests that people have hopes and moral support for the national team, especially when they perform well or win major matches.

The low percentage of negative emotions indicates that the public does not openly criticize or tends to refrain from expressing their dissatisfaction on social media. Despite the national team's inconsistent performance, this may reflect the extraordinary emotional support for them. On the other hand, criticism is usually expressed in a less open and more subtle manner.

With an accuracy rate of 83%, the SVM approach performed satisfactorily in terms of data processing, demonstrating the model's ability to efficiently identify and categorize sentiment. This indicates that SVM is practical for classifying public opinion sentiment on social media platforms such as Twitter.

This study shows that social media users' perceptions of the Indonesian national team during the World Cup qualifiers were generally positive or neutral, which can serve as a starting point for the federation, coaches, or policymakers to measure public sentiment. Additionally, the combination of machine learning algorithms and text mining techniques demonstrates its effectiveness as an analytical tool for evaluating public opinion dynamics in real time.

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