

Viral Voices: Exploring Twitter as a Platform for Public Engagement in the 2022 Philippine Election

CHRISTINE B. TENORIO¹ , YAMMIE P. DAUD² , AND
LALEVIE C. LUBOS³ 

ABSTRACT

The May 2022 Philippine national and local elections were the first to be held under a global pandemic, and social media likely shaped its outcome. Twitter overflows with many election-related conversations barely three weeks before the Philippine national and local elections. Given the physical limitations caused by the Covid-19 epidemic and the rising use of this technology by Filipinos, it was anticipated that support for social media in candidate campaign strategies would expand. This study aims to determine the pattern of relationship and interaction between Twitter users on political topics related to the election. Moreover, this study identifies the likes, dislikes, comments, opinions, or feedback about the public conversation content. Social Network Analysis (SNA) was employed to better understand how Twitter was used in public conversation during the 2022 Philippine election. In addition, Sentiment analysis was used to understand better the online users' positive, negative, or neutral responses. The result shows similarities and differences revealed by the social networks. Results also indicated that users tend to share and seek information from reliable sources such as verified Twitter users and news websites.

Keywords: Social Network Analysis, Twitter, Presidential Election

ABSTRAK

Pemilu nasional dan lokal di Filipina pada bulan Mei 2022 adalah pemilu pertama yang diselenggarakan di tengah pandemi global, dan media sosial kemungkinan besar akan menentukan hasilnya. Twitter dipenuhi dengan banyak percakapan terkait pemilu hanya tiga minggu sebelum pemilu nasional dan lokal di Filipina. Mengingat keterbatasan fisik yang disebabkan oleh epidemi Covid-19 dan meningkatnya penggunaan teknologi ini oleh masyarakat Filipina, dukungan terhadap media sosial dalam strategi kampanye kandidat diperkirakan akan semakin luas. Penelitian ini bertujuan untuk mengetahui pola hubungan dan interaksi pengguna Twitter pada topik politik terkait pemilu. Selain itu, penelitian ini mengidentifikasi suka, tidak suka, komentar, pendapat, atau tanggapan terhadap konten percakapan publik. Secara khusus, Analisis Jaringan Sosial (SNA) digunakan untuk lebih memahami bagaimana Twitter digunakan dalam percakapan publik selama pemilu Filipina tahun 2022. Selain itu, analisis Sentimen digunakan untuk memahami dengan lebih baik tanggapan positif, negatif, atau netral pengguna online. Hasilnya menunjukkan persamaan dan perbedaan yang diungkapkan

AFFILIATION:

¹ College of Public Administration and Governance, Bukidnon State University, Philippines

² College of Public Administration and Governance, Bukidnon State University, Philippines

³ College of Public Administration and Governance, Bukidnon State University, Philippines

CORRESPONDENCE:

christinetenorio@buku.edu.ph

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oleh jejaring sosial. Hasil penelitian juga menunjukkan bahwa pengguna cenderung berbagi dan mencari informasi dari sumber terpercaya seperti pengguna Twitter terverifikasi dan situs berita.

Kata Kunci: Analisis Jaringan Sosial, Twitter, Pemilihan Presiden

INTRODUCTION

While the Philippines in 2022 is still bracing to cope for the Covid-19 pandemic, the race for the Philippines' presidency in 2022 was becoming increasingly crowded. The presidential campaign's ability to successfully use social media and govern digital venues was influential in shaping public opinion. Social media has become a powerful force in Philippine society ([Quitzon, 2021](#)). It is a straightforward and hassle-free method of consuming content, especially considering intermittent and erratic internet connectivity. Political actors would do anything to gain the public's attention because social media is such a prominent venue for influencing public conversation and is so readily accessible ([Quitzon, 2021](#), [Sanvictores, 2022](#)).

Social media is used by more than 90% of Internet users in the Philippines. On average, a Filipino uses social media for around four hours a day ([Macaraeg, 2022](#)). A 2017 survey found that 87 percent of Filipinos with internet access trust information on social media more than conventional media ([Quitzon, 2021](#), [Calimbahin, 2021](#)). Filipinos, however, find it exceedingly challenging to fact-check the information they read on their Twitter, Facebook, or Messenger, WhatsApp, and Viber conversations due to the unreliable internet connectivity and the majority of the rest of the web being copy-protected ([Sanvictores, 2022](#)).

This study focused on how Twitter social media was used in public discourse during the 2022 Philippine elections. The number of Filipinos using Twitter has considerably increased. People started using Twitter to distribute information and as a source of information. Like other social media sites, Twitter's user base is growing ([Esteves, 2016](#)). Filipino internet users use a lot of election-related hashtags, and many of them show support for

their respective presidential candidates. Political campaigns have taken advantage of the vast amounts of data that platforms make available to get insights into user opinions and, as a result, develop their campaign strategy ([Griffith Asia Institute, 2020](#)). The assumption that user-posted thoughts and opinions influence election sentiment and social network coverage is only strengthened by the massive investments made by politicians in social media campaigns in the lead-up to an election, as well as the discussions and debates between their followers and opponents.

The Social Network Analysis (SNA) is utilized in this study to understand better how Twitter was used in the public debate during the 2022 Philippine election. SNA is a sociological method that examines patterns of links and interactions between social actors to ascertain the underlying social network structure using network theory ([Cheong, 2011](#)). Sentiment analysis is also used to comprehend better internet users' positive, negative, or neutral replies. The sentiment analysis classifies comments, opinions, likes, dislikes, and feedback from online users as either positive, negative, or neutral. Twitter, as previously stated, is a text-messaging microblogging social networking platform. Tweets are posts sent to this social media platform, as opposed to the other two, which focus more on photos and may include extensive written papers ([Budiharto & Meiliana, 2018](#)).

As a result, this study concentrates on Twitter data to provide more accurate information for social networks and sentiment analysis to gauge the debate surrounding the 2022 Philippine presidential election. In the Philippines, fewer studies have been conducted on this topic. As a result, the study's purpose is to collect data using the Twitter API, use a variety of classifiers, and identify various trends to evaluate public debate on elections. In addition, social network and sentiment analysis were used to make judgments.

RELATED LITERATURE

This part of the article explains related studies in the field of election using social media. It includes research from numerous scholars on several elections who utilized various methodologies in the field of election using social media.

An interesting investigation, “Emotion analysis of Twitter using opinion mining,” attempted to classify opinions into five emotions: happiness, rage, fear, sadness, and disgust, rather than just positive, negative, and neutral. They used a two-step approach, extracting opinion words and then using a proprietary algorithm to calculate emotional values in opinion terms ([Kumar et.al, 2015](#)) on the utility of social media data in election prediction. Their concern was that numerous political parties attempted to invoke their propaganda and fake news through various techniques, including using “actors” who influenced people.

[Huyen et al \(2017\)](#) used Twitter data from the 2016 US presidential election as their source. Twitter mining analyzes internet tweets in detail. They consider factors such as party, personality, and policy impact when determining the relevance of a major candidacy announcement. [Bansal and Srivastava \(2018\)](#) created a program that gathered tweets about one of the two candidates, sorted them by state, and then used a sentiment algorithm to determine whether the tweet supported one of the candidates or was neutral. Furthermore, collect data for the Uttar Pradesh elections using other terms such as (username and hashtags). Following the data collection, they conducted extensive manual searches for individuals and hashtags, compiling a comprehensive list of hashtags, party leaders, party names, and numerous official Twitter handles. To eliminate URLs, symbols, punctuation, and stop words, more pre-processing was done.

Most of the linked studies presented in this section found that social network and sentiment analysis based on Twitter data was reasonably accurate in analyzing elections worldwide.

OBJECTIVE OF THE STUDY

This study uses social network and sentiment analysis to determine how Twitter social media was used in public conversation during the 2022 Philippine Presidential election. To gain insights into the dynamics of online users discussing the 2022 Philippine Presidential election, it is imperative to first analyze the relationships and interaction patterns among these individuals. Once these patterns have been discerned, the next step involves a comprehensive examination of the sentiments expressed through likes, dislikes, comments, opinions, and feedback associated with the election-related content. These sentiments will be categorized into three distinct areas: positive, negative, and neutral responses. This multifaceted approach not only aids in understanding the intricacies of online political discourse but also facilitates a nuanced understanding of public sentiment surrounding the election.

CONCEPTUAL FRAMEWORK

This research is based on Social Network Analysis (SNA). [Witanti \(2017\)](#) defines SNA as “the process of characterizing a person’s interaction with another person within the context of social interaction.” Utilizing social networks like Twitter, blogs, websites, and Facebook, SNA can identify the relationship patterns of online users ([Alfarhizi and Hafidz, 2020](#)). SNA refers to the process of describing the relationship between actors in social interaction. Nodes (actors) and connections (relationships) comprise SNA. Nodes represent network participants, whereas linkages represent interactions between fellow actors ([Drakopoulos et al., 2020](#)). Furthermore, SNA is a sociological method that makes use of network theory to investigate social actor connection and interaction patterns to pinpoint the underlying social network structure ([Alfarhizi and Hafidz, 2020](#)). It has been applied to research social interaction across a variety of fields, including computer-mediated communications, organizational behavior, inter-organizational relationships, col-

laborative networks, and many more ([Mezzanzanica et al, 2018](#)).

Sentiment Analysis is also used in this study. Sentiment analysis, also known as opinion mining, is the study of people's views, sentiments, evaluations, appraisals, attitudes, and feelings about products, services, organizations, individuals, situations, events, themes, and characteristics. The terms sentiment analysis and opinion mining were coined in ([Tetsuya & Yi, 2003](#)). Across diverse granularity levels, sentiment analysis stands as a vital Natural Language Processing task. Its applications extend into the realm of politics, serving as a tool to monitor political stances and discern the alignment or disparity between governmental rhetoric and actual actions ([Kushal et al, 2003](#)). Additionally, it holds potential in predicting election outcomes, providing valuable insights for informed decision-making. In the realm of social media analysis, sentiment research often commences by indexing tweets using hashtags, allowing for the collection of pertinent data for comprehensive analysis ([Hamling, 2016](#)). Typically, sentiment analysis involves the creation or discovery of a lexicon comprising terms strongly correlated with positive or negative emotional states.

Moreover, Twitter stands as the paramount platform underpinning this realm of research. Established in 2006 by Biz Stone, Evan Williams, and Jack Dorsey, Twitter pioneered the domain of microblogging and social networking. Users partake in engaging text-based conversations, constrained to 280 characters, by sending and perusing tweets within this expansive social media network. Remarkably, the platform boasts a colossal user base, with a staggering 336 million active users per month. At the core of Twitter's functionality lies a fundamental feature: the capacity to retweet, allowing users to swiftly share or repost another person's content for all their followers to view. Retweets are distinctly symbolized by a reversing arrow positioned at the bottom of the original tweet. Concurrently, hashtags, denoted by terms commencing with the “#” symbol, play a pivotal role in organizing and tracking discussions. By integrating widely recognized

hashtags during Twitter chats, users can elevate the visibility and trending status of the respective topic. Within this vibrant digital landscape, users can also directly mention another individual's username in their tweets, ensuring that the mentioned user and their followers receive the message. It is important to emphasize that all interactions on Twitter are inherently public, enabling seamless connections and interactions. Engaging with a tweet via a reply initiates a public discourse, specifically directed at the tweet's creator, promoting dialogue, and enriching the overall Twitter experience ([Harkan et al., 2019](#)). The schematic diagram shows the paradigm of the study.

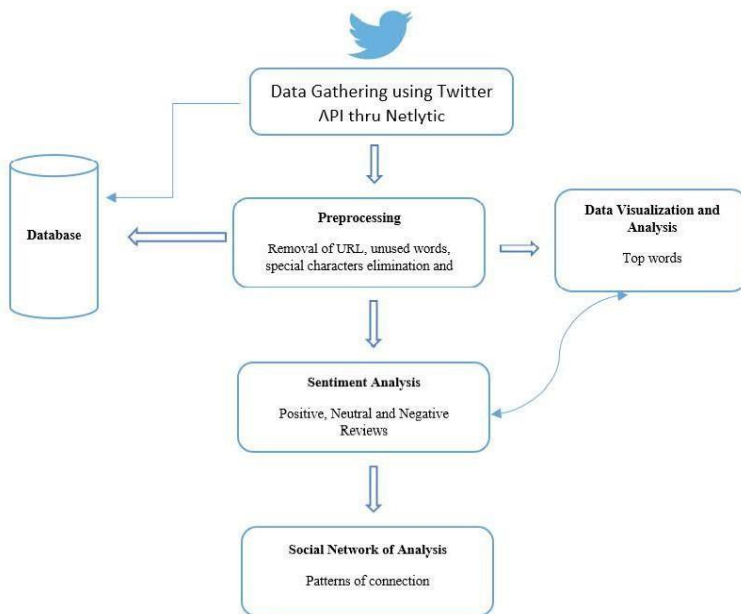


Figure 1. Schematic Diagram

The study was segmented into distinct subtasks to organize the workflow. Initially, data collection for our model was prioritized, which involved the retrieval of Twitter data using the streaming API through Netlytic and its subsequent conversion into CSV format for processing, evaluation, and enhancement. Preliminary

analysis, such as identifying key terms, was conducted post-cleaning and pre-processing of the tweets, aiming to grasp the fundamental aspects of data and narrative generation from the available dataset. Subsequently, we progressed to the following phase, which entailed applying sentiment analysis using RapidMiner on the meticulously cleaned tweets. The outcomes were evaluated based on the proportions of positive, negative, and neutral tweets. Finally, Gephi was utilized for social network analysis on the dataset, with users represented as nodes and retweets as edges connecting them. This analysis helped us pinpoint leaders among the online users, revealing the directional patterns in the data and substantiating the small world phenomenon.

METHODOLOGY

RESEARCH DESIGN

This study employs Twitter data to conduct analyses on social networks and sentiment. The methodology demonstrates the application of Twitter in the context of public discussions during the 2022 Philippine election. The researchers established a dedicated Twitter API account linked to their Twitter profile, utilizing Netlytic software for the necessary Twitter API authentication. To gather tweets pertaining to the 2022 Presidential Election and gauge prevailing sentiment based on election-related hashtags, the researchers utilized a Twitter app. The collected tweets were stored in a database, encompassing fields such as Twitter ID, hashtags, tweet creation timestamp, tweet content, retweet count, and favorite count. The data obtained from Twitter was then subjected to sentiment analysis, revealing the alignment of terms within tweets with respect to predefined positive, neutral, and negative word lists. Additionally, social network analysis was employed to scrutinize the interconnections among internet users, providing insights into the patterns of online engagement.

RESEARCH LOCALE

The research was carried out on the Twitter platform, focusing on the interactions of Twitter users. Throughout the study, user anonymity was carefully maintained, ensuring that data collection (including tweets, retweets, hashtags, tweet content, etc.) was conducted impartially using specialized software. The researchers specifically selected the time frame from May 9 to May 13, 2022, to gather a substantial dataset, with a global reach of up to 10,000 data points, showcasing the software's capacity for data collection. This software proficiently discerned and determined various data aspects, including quantities, relationships, and the selection of data, networks, and participants, contributing to the comprehensive analysis.

RESEARCH PARTICIPANTS

The study engaged actively involved Twitter users during the period of May 9 to May 13, 2022, whose Twitter activity revolved around the Philippine elections, encompassing a global perspective. The dataset was constrained to a maximum of 10,000 data points. The software effectively identified and selected data based on parameters such as Twitter IDs, hashtags, tweet timestamps, tweet content, retweet counts, and favorite counts, ensuring a comprehensive analysis.

RESEARCH INSTRUMENT

The data for this study is derived from digital documents, more specifically, information gathered from Twitter interactions like mentions, replies, and retweets. The researchers utilized crawling software from Netlytics.org for data retrieval. Subsequently, the collected data was meticulously assessed using Gephi tools and Rapid Miner. The objective was to comprehend the role of Twitter in shaping public discourse during the 2022 Philippine Presidential election, employing both social network and sentiment analysis. The study focused on aggregating tweets from the initial day of the election, starting on May 9th and spanning up

to the 13th, 2022. The primary instrument to be used in this study is shown below.

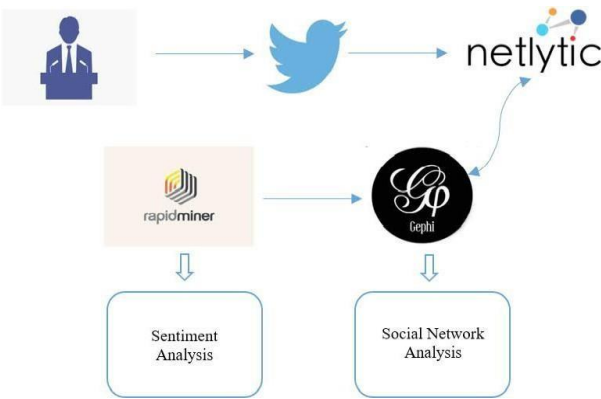


Figure 2. Primary Instrument Diagram

While software aids researchers in efficient electronic data collection and management, it also presents certain limitations. In the context of this study, the Netlytic program encountered two notable constraints. The first limitation revolves around the software’s output readability. Within the realm of Twitter interactions, encompassing mentions, retweets, replies, and likes, the software could effectively interpret and process three out of the four: mentions, replies, and retweets. However, it could not handle the “like” interactions. The second constraint pertains to the volume of data that can be extracted. The free version of Netlytic is restricted to crawling up to 10,000 uploaded tweets. Consequently, the study could only display a maximum of 10,000 tweeted mentions, replies, or retweets, highlighting this limitation.

DATA ANALYSIS

This study uses a procedure and data analysis through data processing, sentiment analysis, and social network analysis.

DATA PRE-PROCESSING

The first phase involves data processing, a crucial step aimed at refining the dataset. The primary objective of this pre-processing approach is to mitigate the impact of noise and outliers, which could complicate the accurate determination of the sentiments conveyed in messages or tweets. This noise typically encompasses elements like punctuation, numerals, special characters, or sentences that lack coherence within the text's context. To enhance the quality of the dataset, actions such as removing Twitter usernames, punctuation, numerals, brief words, and special characters are undertaken, streamlining the data for subsequent analysis.

SENTIMENT ANALYSIS

The second phase involves conducting sentiment analysis, a critical step in interpreting and classifying the emotional tone either positive, negative, or neutral embedded within textual data. This process leverages the text analysis tools in Rapid Miner to achieve the categorization. Sentiment analysis often entails the generation or identification of a lexicon containing terms distinctly linked to markedly positive, negative, and neutral emotions. A preponderance of positive and negative terms signifies a positive or negative sentiment, respectively, while a combination of negative terms with a scarcity of positive ones may suggest a negative emotional disposition. In the context of Twitter sentiment analysis, the initial step entails indexing tweets against hashtags, enabling the comprehensive collection of pertinent data for a thorough examination.

SOCIAL NETWORK ANALYSIS

The third step involves conducting social network analysis. In this phase, we leverage Twitter's 'retweet' feature, a pivotal component that holds significant analytical value. The act of retweeting is an indicator of approval and support for a message, emphasizing the importance of this feature. Particularly in the

political sphere, users often retweet messages from political party leaders and analysts they closely follow, enhancing the visibility and spread of those messages. In this analysis, each retweet gives rise to two new nodes within the network. One node corresponds to the original tweet, while the other signifies the user who retweeted it. For instance, if User A composes a tweet and User B retweets it, both User A and User B transform into network nodes interconnected by an edge. This edge is undirected, symbolizing the mutual relationship established by the retweet. Even in cases where User B retweets the same tweet by User A multiple times, a single edge persists, illustrating the enduring connection between Users A and B in the network. This dynamic aspect highlights the power and influence of retweeting in the realm of social network analysis.

Finally, the researchers utilized Gephi, a robust tool for both social network analysis and visualization. Gephi employs an efficient community detection technique to swiftly identify and delineate distinct communities within extensive networks. Subsequently, every node representing an entity within the network and the corresponding community were documented and saved in a CSV file for further analysis. The researchers meticulously studied these communities, categorizing them by analyzing the on-screen names or usernames associated with each group. This step allowed for a deeper understanding of the network structure and the relationships between various entities, contributing valuable insights to the overall analysis.

ETHICS STATEMENT

In conducting this research, ethical standards were diligently adhered to. The researchers affirmed that there were no ethical concerns associated with mapping the user networks and understanding the sentiments of the participants. This assurance stems from the careful implementation of complete anonymity and conducting the study within the designated week of the election, from May 9 to May 13, 2022. Moreover, the study deliberately

excluded the campaign period, which concluded on May 7, 2022, further ensuring the ethical appropriateness of the research.

RESULTS AND DISCUSSION

For this study, we meticulously curated a dataset comprised of a maximum of 10,000 tweets, meticulously scanned and acquired through Netlytic. The primary objective was to delve into the dynamics of Twitter as a platform for public discourse during the 2022 Philippine Presidential election, employing a comprehensive approach involving both social network and sentiment analysis. Our dataset was meticulously gathered, focusing specifically on the initial day and the ensuing election week, from May 9 to May 13, 2022, offering a snapshot of critical insights during this significant period of political activity. The authors chose hashtags that were trending on Twitter and represented public conversation about the election, as shown in Table 1.

Table 1. Trending hashtags related to the Presidential election in the Philippines

Hash tags			
#halalan2022	#eleksyon2022	#election2022ph	#votesafepilipinas

SOCIAL NETWORK ANALYSIS

The social network analysis, focusing on the most recent hashtags, entailed an intricate interplay among a broad spectrum of 8,864 unique Twitter users. Employing the powerful Gephi tool, this analysis meticulously rendered the interactive network representing the public discourse on Twitter throughout the 2022 Philippine Presidential election. The resulting representation took the form of a sociogram, where everyone was symbolized as a node and linked by connecting lines known as edges. These edges vividly illustrated the various dimensions of user engagement, encompassing actions like retweets and replies. The network’s structure was visualized using the dynamic Force Atlas2 algorithm, facilitating a comprehensive and visually appealing portrayal of the intricate web of interactions. The following are the outcomes of the social network analysis process.

Table 2. Network Attributes Value

Network Attributes	Value
Total Nodes	8864
Total Edges	9367
Average Degree	2.113
Average Weighted Degree	2.256
Network Diameter	11
Average Path Length	4.03
Number of Communities	124

Below is the initial visualization employed Force Atlas 2 without incorporating text labels or highlighting Twitter’s top users. However, this unadorned visualization made it challenging to discern the network due to the nodes’ ambiguous positioning. Despite the difficulty in identifying precise node locations, there was a potential observation: it appeared that these individuals were relatively close to one another within the network, hinting at some form of interconnectedness or clustering.

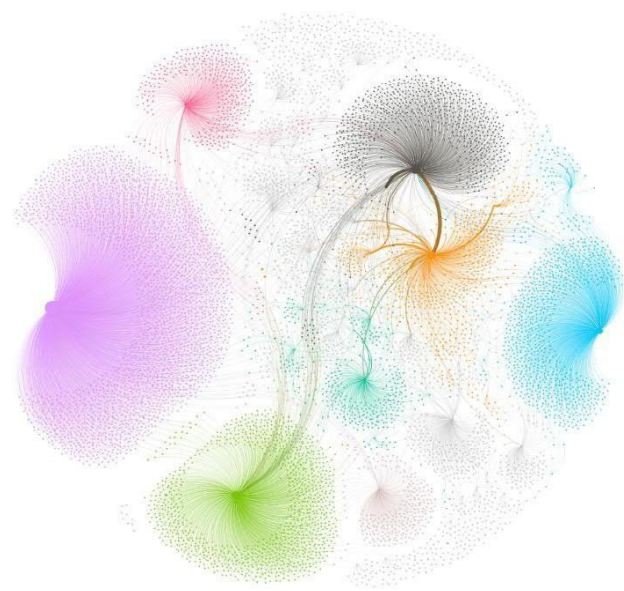


Figure 3. Force Atlas2 without labels

The second visualization was created with Force Atlas 2 with text labels indicating top Twitter users. The top users were recognized as an indicator of a node's centrality. The top users in the social network developed include @rexelbartolome @daywreckoning @ABSCBNEWS @AmbMacArthur @pat_delacerna @pinoyweekly @alltojohn @altermidya, according to the results. According to Twitter profiles, three of the social network's top actors are news media outlets, with the remainder being Twitter influencers with the highest followers. These users are considered the actors who substantially impacted the engagement for this particular social network.

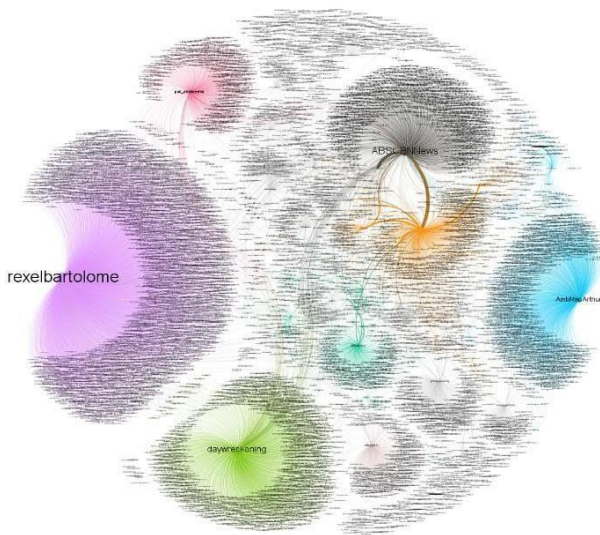


Figure 4. Force Atlas2 with labels

Here are the central actors in each community in the network. The results of the centrality calculation are as follows.

Table 3. Central Actor	
Communities	Actor
Purple	Rexelbaítolome
Green	Daywieckoning
Black	ABSCBNEWS
Blue	AmbMacAíthuí
Pink	Pat_delaceína
Gray	Pinoyweekly
Peach	Alltoojohn
Aqua	Alteímidya

SENTIMENT ANALYSIS

The author used Netlytic’s crawled 10,000 Tweets for sentiment analysis. Using Rapidminer, this method is carried out by text mining public conversations on Twitter during the 2022 Philippine Presidential election. Table 4 displays the classification sentiments toward public discourse during the 2022 Philippine Presidential election. Positive feelings for the public conversation accounted for 2707 or 27.07% of overall sentiment, while negative sentiment accounted for 1005 or 10.05%, and neutral emotion accounted for 6288 or 62.88% of total sentiment implemented. Based on the findings, it is possible to assume that the majority of public opinion during the 2022 Philippine Presidential election is neutral.

Table 4. Sentiment Analysis	
Positive	2707
Negative	1005
Neutral	6288
Total	10,000

The following is an example of sentiment from the 2022 Philippine Presidential election public conversation sentiment classification results.

tween May 9 and May 13, 2022, commonly referred to as the election week. This period witnessed the onset of extensive public discourse regarding the election, making it a pivotal time frame for the study. Notably, the study focused on tweets related to the 2022 Philippine Presidential election, identified through prominent hashtags such as #halalan2022, #eleksyon2022, #election2022ph, and #votesafepilipinas, which were among the most widely used and recognizable hashtags during that particular time window.

Employing an in-depth social network analysis on the dataset of retweeted tweets, the study meticulously examined the communities that had coalesced within the network. The analysis illuminated the presence of eight significant communities, underscoring the tightly-knit nature of online communities when engaged in public discourse during the 2022 Philippine election. Intriguingly, the investigation unveiled that these online communities were notably cohesive, showcasing their strong interconnectedness within the discourse landscape. Notably, the top three largest communities, as indicated by the highest betweenness centrality scores, were led by influential Filipino netizens such as @Rexelbartolome and @daywreckoning. Additionally, a significant community was associated with @ABSCBNEWS, a prominent news media outlet, further highlighting the diverse influencers shaping the discourse.

Social network analysis (SNA) emerged as a powerful tool, presenting a compelling visual representation of the Filipino online community's dynamics in seeking and disseminating information. This visual depiction was instrumental in comprehending the intricate patterns of information flow and user interactions within this online space. Furthermore, the study integrated sentiment analysis to discern the prevailing sentiments in tweets within the public conversation during the 2022 Philippine Presidential election. The analysis revealed that the majority sentiment observed was neutral, reflecting a balanced tone in the overall discourse. Delving into the specific content of the

tweets, the top three prominent words that emerged from the public conversation during the 2022 Philippine Presidential election encompassed discussions about martial law, challenges in reading (*nahihirapan magbasa*), and the resounding sentiment of “never again.” These significant terms shed light on the central themes and concerns within the electoral discourse during that period.

Understanding the behavioral patterns of an online community in social media through comprehensive social network and sentiment analysis holds immense significance, particularly within the Philippine context where relatively fewer studies have delved into this subject matter. This research offers a valuable stepping stone towards unveiling the dynamics of online communities in the Philippine social media landscape. For future research endeavors, a thoughtful suggestion is to prioritize the selection of tweets that genuinely encapsulate the collective community opinion, moving beyond a mere reliance on trending hashtags. This approach ensures a more authentic representation of the sentiments and perspectives prevalent within the online community.

Expanding the scope of data mining and analysis beyond the election period is vital, extending to the post-election phase. This extension is crucial in acquiring a more comprehensive and accurate analysis of the ongoing public discourse, not being confined solely to electoral cycles. It provides a more nuanced understanding of the online conversations that persist even after significant events like elections. Furthermore, future researchers should consider the convenience and credibility offered by accessing tweets via the Twitter API. This method has showcased its efficacy in delivering reliable results, making it a preferred choice for data collection and analysis in studies of this nature. Emphasizing such methodological preferences can enhance the rigor and validity of future investigations in this domain.

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