

## THE SENTIMENT ANALYSIS OF INDONESIAN NATIONAL LIBRARY'S TWITTER AND INSTAGRAM

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**Abstrak.** Sosial media merupakan salah satu perangkat teknologi yang dapat digunakan oleh masyarakat untuk menyebarluaskan suatu data atau informasi secara real time. Dalam hal ini pendekatan yang digunakan ialah Social Media Analytic (SMA) framework khususnya Sentiment analysis (SA) dengan menggunakan Brand24. Analisis sentiment adalah pengukuran sentimen/emosional manusia pada sosial media berdasarkan analisis isi konten (positif/negatif/netral). Penelitian ini bertujuan untuk mengetahui analisis sentimen pada akun twitter dan instagram consistentlv perpustakaan nasional. Data penelitian ini diambil dari analisis data twitter dan instagram dengan menggunakan kata kunci yaitu @perpusnas1 #perpusnas #perpustakaan nasional. Hasil penelitian menunjukkan sebanyak 24 mention dari pengguna twitter dan 55 mention pengguna Instagram. Pada twitter jumlah sentiment analisis positif 3, negative 3 dan netral 18 sedangkan pada Instagram jumlah sentimen analisis positif 33, negatif 4, dan netral 18.

**Kata Kunci:** *Sentiment Analysis; Social Media; Social Media Analysis; National Library; data analytics*

**Abstract.** Social media is one of the technological devices that can be used by the public to disseminate data or information in real time. In this case, the approach used is the Social Media Analytic (SMA) framework, especially Sentiment Analysis (SA) using Brand24. Sentiment Analysis is a measurement of human sentiment/emotional on social media based on content analysis (positive/negative/neutral). This study aims to determine the analysis of sentiment on the twitter and instagram accounts of the national library. The research data was taken from Twitter and Instagram data analysis using the keywords @perpusnas1 #perpusnas #perpustakaan nasional. The results showed that there were 24 mentions from twitter users and 55 mentions from Instagram users. On Twitter the number of positive sentiment analysis is 3, negative 3 and neutral is 18, while on Instagram the number of sentiment analysis is positive 33, negative 4, and neutral 18.

**Keyword:** *Sentiment Analysis; Social Media; Social Media Analysis; National Library; data analytics*

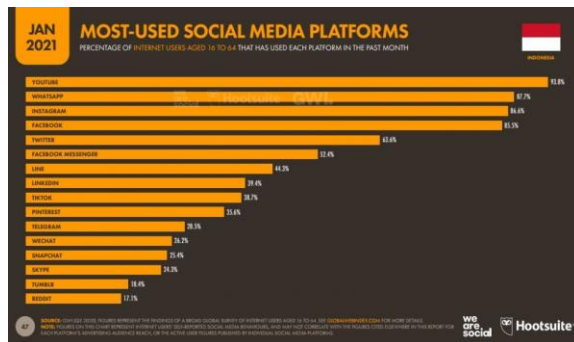
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**INTRODUCTION**

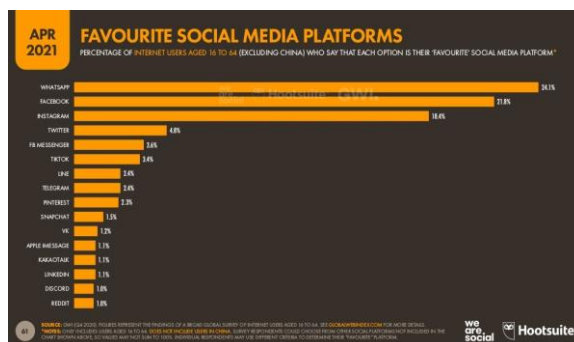
Social media is one of the technological devices that can be used by the public to disseminate data or information in real time. The role of social media today is not only as a technological device, but can also be used by the wider community for certain purposes, such as for business, inciting or spreading kindness. If for business it can be used as a tool to promote a product, but if it is to incite badness, it can be by making controversial hoax information. This is in accordance with the statement Criado et al., (2013) "This special issue attempts to provide an integrated perspective on social media in government with a particular focus on the implications of innovation in the public sector. To do so, we have used a structure based on three dimensions: tools, goals, and topics." Based on this statement, the definition of social media in government consists of three dimensions, namely as a technological device, has a specific purpose and topic, the topic here is to build positive framing based on information/knowledge related to the government such as information on government programs. In this era of pandemic, almost everyone uses social media for communication such as whatsapp, twitter, instagram and so on. Problems that will arise due to the massive use of social media are related to privacy; data security; and data management, if not taken seriously can have fatal consequences which can be used by someone for their personal interests. Social media is like two sides of a knife, on the one hand it can have a positive impact but on the other hand it can have a bad impact. Therefore, the role of the government is needed to control social media. This is in accordance with the statement Bertot et al., (2012) "However, interacting via social media introduces new challenges related to privacy, security, data management, accessibility, social inclusion, governance, and other information policy issues".

The need for government intervention in the use of social media because the public cannot be separated from the use of the internet, especially social media. Based on data from Hoot suite 2021, the use of social media in Indonesia and in the world, among others.



**Figure 1.** Most-used social media platforms

Source: We Are Social (2021)



**Figure 2.** Favourite social media platforms

Source: We Are Social (2021)

Data on the use of social media in Indonesia and the world is not much different that social media whatsapp, youtube, facebook, instagram and twitter still occupy the top 5. This is because the 5 social media have become primary needs and are in direct contact every day by the Indonesian people for communication, work/business and entertainment purposes.

The National Library is one of the non-ministerial state institutions of the Indonesian government. The National Library has the functions and duties, among others, to carry out government duties in the library sector in accordance with the provisions of the legislation, including: establishing national policies, general policies, and technical policies for library management; carry out coaching, development, evaluation, and coordination of library management; fostering cooperation in the management of various types of libraries; and develop national library standards. ([https://www.perpusnas.go.id/task\\_function\\_wenangan.php?lang=id](https://www.perpusnas.go.id/task_function_wenangan.php?lang=id)). From a positive

perspective, social media can be used as a basis for government decision making, such as social media report data related to products that are favored by the wider community. “For supporting decision-making processes, companies make use of social media reports, created ex post and based on predefined key performance indicators, or they make use of a dashboard for getting on-going analyzes based on real-time social media data”.(Tsou et al., 2015). “In this case, the approach that can be used is the Social Media Analytic (SMA) framework” (Stieglitz et al., 2018). “Through conducting social media analytics, governments and political parties are aiming to gain insights from the communication for deriving useful strategies for the next period of elections” (Nulty et al., 2016). “This is because Social Media Analytics (SMA) is carried out in real time. In the Social Media Analytic (SMA) framework approach, one component that can be measured is this is in accordance with the statement” Gautam & Yadav (2014) Sentiment analysis is a process where the dataset consists of emotions, attitudes or assessment which takes into account the way a human thinks. Based on the problems above, the researcher wants to do research on how to analyze the sentiments of the Indonesian people towards the National Library's Twitter and Instagram social media accounts.

**LITERATURE REVIEW**

**Social Media**

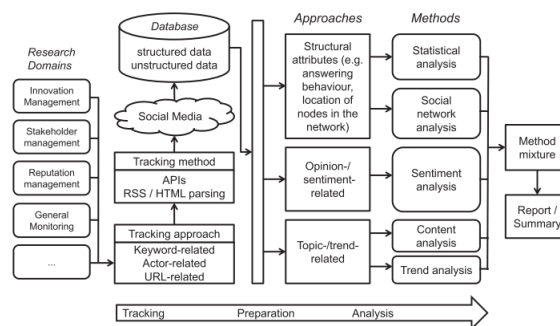
Social media is a set of technological tools that can be used by the wider community for various purposes, both for communication, work/business, entertainment or to spread hoaxes. according to Mayfield (2008)“...Social media is best understood as a group of new kinds of online media, which share most or all of the following characteristics participation, openness, conversation, community, and connectedness...”. Based on these criteria, it can be said that Twitter and Instagram are social media, this is because the two social media have member participation, are open, can communicate, have communities / associations and are interconnected. So it can be said that Titter and Instagram are social media.

**Social Media Analytics (SMA)**

Social Media Analytic (SMA) is an approach to measure social media performance in real time such as topics trending, number of likes, comments, shares, statistical analysis, topic mapping/social network analysis, and sentiment analysis. according to (Stieglitz et al., 2018) doing Social Media Analytics consists of 4 stages

1. Discovery
2. Tracking/Collecting
3. Preparation
4. Analysis (Stieglitz et al., 2018)

Based on the information above, the stages of doing Social Media Analytic starts from making discovery, in this case the determination of the theme to be raised or the subject then the second stage is the tracking/collecting stage; search and collect data from data sources such as twitter and instagram, then the third stage is preparation or preparation for analysis, whether to be analyzed according to trending topics/theme networks/opinion sentiments, the last stage is to analyze according to its objectives.



**Figure 3. Sentiment Analysis (SA)**  
Source: (Stieglitz & Dang-Xuan, 2013)

“Sentiment Analysis (SA) is a sentiment analysis of opinions or opinions written or made by someone, usually those opinions are disseminated on social media. Next, the opinion is analyzed for sentiment, whether it is positive, negative or neutral. . Sentiment analysis is an activity to get the sentiment or opinion on textual data that reflects sentiment or opinion of the author for certain entities” (Cambaria et al., 2013; Feldman, 2013). “From machine learning

point of view, the problem of sentiment analysis is a classification problem, that is, how to classify the class of the textual data into a positive or negative sentiment” (Murfi et al., 2019). However, in this study, researchers used Brand24 Tools, which are easy to use.

Brand24 is a Sentiment Analysis (SA) tool that uses the ESMR algorithm (Estimated Social Media Reach). Estimated Social Media Reach is our own algorithm similar to Impressions - this is the estimated number of people who could have across social media mentions that contain your monitored keywords. We base this number on four things, such as:

1. the number of people who are using your monitored keyword on social media,
2. the number of followers, subscribers, or friends they have,
3. the number of interactions (likes, comments, and shares) under collected posts,
4. and the Visibility Percentage for the selected social network which says how many of them (followers, subscribers, or friends) actually see those posts on average. (<https://help.brand24.com/en/articles/3267790-what-is-esmr>)

“In conducting sentiment analysis, the algorithm that can be used is the nave Bayes classifier algorithm” (Feldman & Sanger, 2007). In the nave Bayes classifier algorithm, each document is represented by the attribute pair “X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>... X<sub>n</sub>” where X<sub>1</sub> is the first word, X<sub>2</sub> is the second word and so on. While V is a set of tweet/post categories. At the time of classification, the algorithm will look for the highest probability of all categories of documents being tested (V<sub>map</sub>), where the equation is as follows

$$V_{MAP} = \underset{V_j \in V}{\text{arg max}} \frac{P(x_1, x_2, x_3, \dots, x_n | V_j) P(V_j)}{P(x_1, x_2, x_3, \dots, x_n)}$$

.... (1)

For P (X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>... X<sub>n</sub>) the values are constant for all categories (V<sub>j</sub>) So the above equation can be written as follows

$$V_{MAP} = \underset{V_j \in V}{\text{arg max}} P(x_1, x_2, x_3, \dots, x_n | V_j) P(V_j)$$

.... (2)

The above equation can be simplified into the following:

$$V_{MAP} = \underset{V_j \in V}{\text{arg max}} \prod_{i=1}^n P(x_i | V_j) P(V_j)$$

.... (3)

Information:

- V<sub>j</sub> = category *tweet/post* j = 1,2,3...n  
Where in this study
- j<sub>1</sub> =category *tweet/post*negative sentiment,
- j<sub>2</sub> = category *tweet/post*positive sentiment
- j<sub>3</sub> = category *tweet/post*neutral sentiment
- P(X<sub>i</sub>|V<sub>j</sub>) = Probability X<sub>i</sub> in category V<sub>j</sub>
- P(V<sub>j</sub>) = Probability of V<sub>j</sub>

For P(V<sub>j</sub>) and P(X<sub>i</sub>|V<sub>j</sub>) calculated during training where the equation is as follows:

$$P(V_j) = \frac{|docs\ j|}{|contoh|}$$

....(4)

$$P(x_i | V_j) = \frac{n_k + 1}{n + |kosakata|}$$

....(5)

Information:

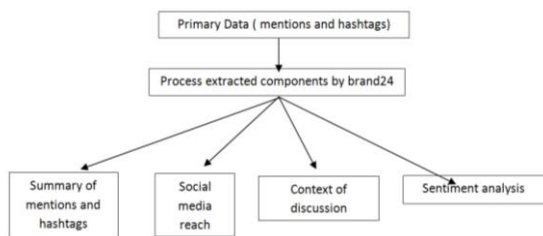
- |docs j| = number of documents for each category j
- |example| = number of documents from each category
- n<sub>k</sub> = the number of occurrences of each word
- n = the number of times the word occurs in each category
- |vocabulary| = sum of all words from all categories. (Pratama et al., 2019)

The following are some previous studies related to social media and sentiment analysis,

among others Dwianto et al., (2021) The Sentiments Analysis of Donald Trump and Jokowi's Twitters on Covid-19 Policy Dissemination. Prayoga, (2020) How Jokowi Communicates with the Public During Covid-19 Crisis: An Analysis of Tweets on Twitter. Pratama et al., (2019) Implementation of Sentiment Analysis on Twitter Using Naïve Bayes Algorithm to Know the People Responses to Debate of DKI Jakarta Governor Election.

**RESEARCH METHODOLOGY**

This study uses a Social Media Analytic (SMA) framework approach, especially Sentiment analysis (SA) using Brand24. Brand24 is a social media analysis tool that offers many features to analyze data from social media such as Facebook, Twitter, Instagram and can measure social media performance such as the number of likes, responses, shares, and positive and negative mentions. The data of this research were taken from social media twitter and instagram of the national library. The purpose of this study is to analyze the sentiment on Twitter and Instagram of the National Library, whether it is positive, negative or neutral. The keywords used are @perpusnas1 #perpusnas #perpustakaanasional using Indonesian in the last one year period. The following is a research flow chart.



**Figure 4.** Research Design

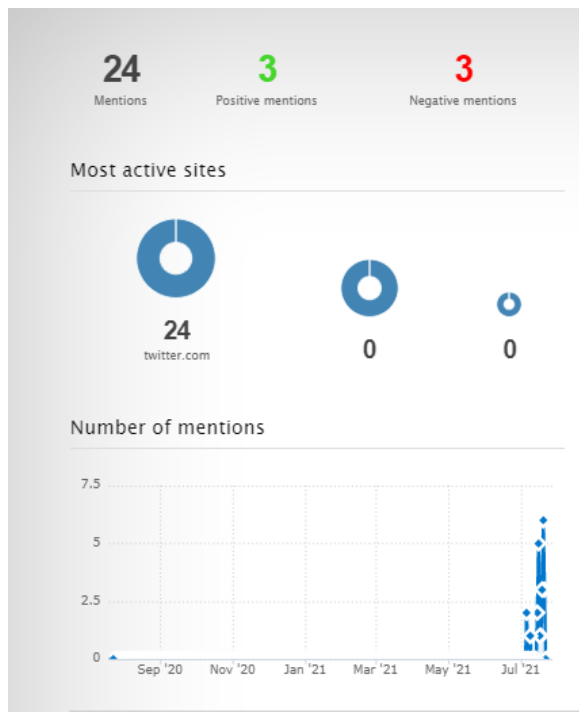
Collection process in this study was carried out by Brand24. Through this software, it is only necessary to select the selected keywords. The keywords used in this research are @perpusnas1 #perpusnas #perpustakaanasional. Then, determine the period of data coverage, in this study the period is one year. These keywords are processed by this software automatically to

generate infographics in the form of sentiments, summary of mentions, hashtags, and reaches.

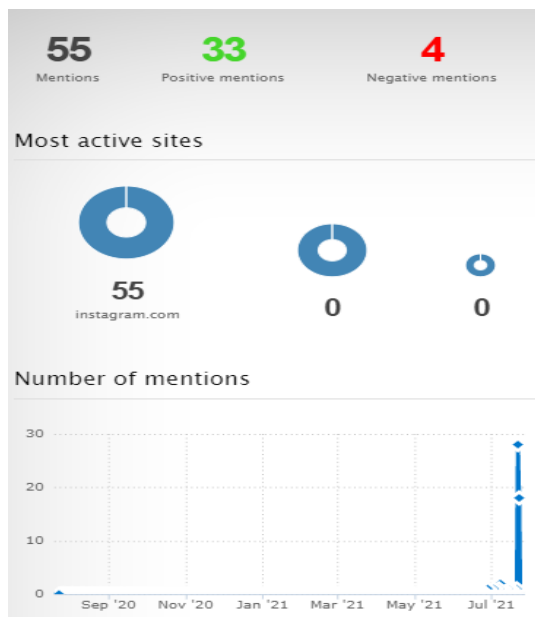
**RESULT AND DISCUSSION**

**Number of Tweets/Mentions**

This graph shows the search results according to the keyword @perpusnas1 #perpusnas #perpustakaanasional using twitter and instagram.



**Figure 5.** Number of mentions on Twitter



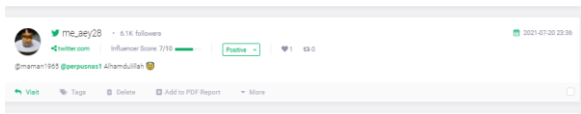
**Figure 6.** Number of mentions on Instagram



Based on the results of the analysis through brand24, it can be seen that the keyword @perpusnas1 #perpusnas #perpustakaan nasional is more widely used by Instagram users than Twitter users. The first graph shows the results of mentions using the keyword @perpusnas1 #perpusnas #perpustakaan nasional as many as 24 mentions from twitter users, while the second graph shows 55 mentions using the keyword @perpusnas1 #perpusnas #perpustakaan nasional from instagram users. The two graphs show different sentiment analysis results, on Twitter the number of positive analysis sentiments is 3, negative 3, and neutral is 18. While on Instagram the number of positive analytical sentiments is 33, negative 4 and neutral is 18.

So it can be concluded that the use of the keyword @perpusnas1 #perpusnas #perpustakaan nasional more widely used by Instagram users than twitter.

**The Results of The Analysis Of Positive and Negative Sentiments on Twitter and Instagram Social Media**



**Figure 7.** Example of a positive sentiment tweet

One example of a positive sentiment tweet with the keyword @perpusnas1 #perpusnas #perpustakaan nasional on Twitter is the @me\_aey28 account with 6.1k followers and 1 likes on the tweet.



**Figure 8.** Example of a negative sentiment tweet

One example of a negative sentiment tweet with the keyword @perpusnas1 #perpusnas #perpustakaan nasional on twitter is by the @primastefan account with 142 followers.



**Figure 9.** Example of a mentioning of positive sentiment

One example of mentioning the results of positive sentiment with the keyword @perpusnas1 #perpusnas #perpustakaan nasional on Instagram is the @eventpenulis account with 5,876k followers and 171 likes on the post.



**Figure 10.** Example of a mentioning of negative sentiment

One example of mentioning the results of negative sentiment with the keyword @perpusnas1 #perpusnas #librarynasional on Instagram is the @openlibrary.telu account with 10.1k followers and 79 likes on the post.

**Sentiment Analysis**

Analysis of user sentiment using the keyword @perpusnas1 #perpusnas #perpustakaan nasional on twitter and instagram.

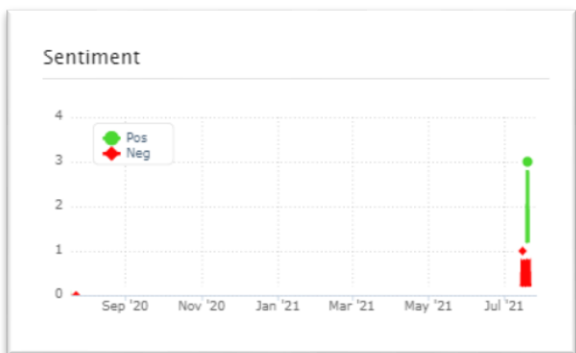


Figure 11. Twitter sentiment result

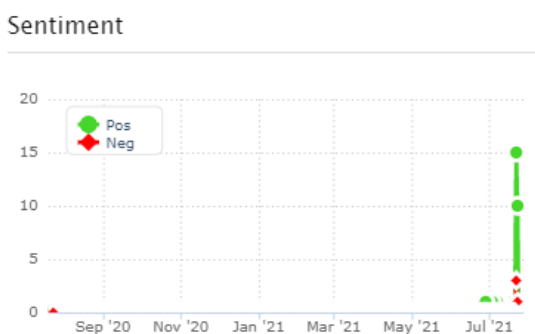


Figure 12. Instagram sentiment result

Sentiment analysis is a tool used for language processing, text analysis, computational linguistics for the identification and classification of public opinion about the media. Sentiment analysis is carried out to see opinions or opinion tendencies towards a problem or object by someone, whether they tend to have negative or positive views or opinions. The purpose of sentiment analysis is to determine the researcher's attitude towards a document subject

In this study, the results of sentiment analysis based on the two graphs above show that there are positive and negative sentiment analysis. On 20 September to 21 July 2021 there are 3 positive sentiments and 3 negative sentiments on Twitter, while on 20 September to 21 July 2021 on Instagram there are 33 positive sentiment analysis and 4 negative sentiments.

**Mention With The Most Likes by Marking @Perpusnas1 #Perpusnas #Perpustakaanasional**

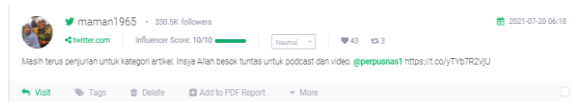


Figure 13. Result of tweets on twitter

From the search results for the keyword @perpusnas1 #perpusnas #perpustakaanasional there is a tweet from the @maman1965 account on 20 July 2021 with 330.5K followers with 43 likes and 3 retweets.



Figure 14. Result of tweets on instagram

The search results using the keyword @perpusnas1 #perpusnas #perpustakaanasional on Instagram show the @masukptn account using #perpustakaanasional and #pejuangPTN with 9991 likes and 31 comments on July 14, 2021. The post results from the image show a positive response.

**Comparison Of Twitter and Instagram Visits**

Page	Mentions	Visits	Influencer Score	Options
1 youtube.com	2	34 640 067 313	10/10	🔗 📄
2 instagram.com	55	5 909 975 022	10/10	🔗 📄
3 twitter.com	24	5 898 816 824	10/10	🔗 📄
4 tiktok.com	6	1 167 611 111	10/10	🔗 📄
5 kompas.com	1	189 540 000	10/10	🔗 📄
6 medianindonesia.com	1	1 729 605	1/10	🔗 📄
7 m.co.id	1	802 987	6/10	🔗 📄
8 gorden.org	1	327 970	5/10	🔗 📄
9 euroa.ftb.ac.id	1	N/A	N/A	🔗 📄
10 opns.kompas.com	1	N/A	N/A	🔗 📄

Figure 15. Comparison of result of tweets on Twitter and Instagram

From the results of research using Brand24 with the keywords @perpusnas1 #perpusnas #perpustakaanasional produces comparative data between Twitter and Instagram. The results of mentions between Instagram and Twitter are more mentions on Instagram, namely 55 while on Twitter only 24. Social media visits are mostly occupied by YouTube with 34 640 067 313 visits, while Instagram with 5 909 975 022 visits and





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