Data mining applied about state madrasah using sentiment analysis on Twitter in Indonesian perception

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Article Info

ABSTRACT

Indonesian people prefer private schools with high prices, which is one of the exciting things to study. In fact, in the modern era, public schools have competed with private schools with international categories. The problem in public schools is the parent's perspective on the quality of education in public schools, especially public madrasahs. In addition, cases such as bullying and violence between schools. People on Twitter also have various perceptions of public madrasas, which are considered to have religiosity. This research uses the keywords public madrasah, quality management, and quality taken from Twitter using the Orange application. The amount of data in this research is 300 tweets from Twitter. As a result, there are both negative and positive sentiments toward public madrasas. However, the negative sentiment is higher than the positive sentiment. This means parents have more trust in private schools than in public madrasahs.

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1. INTRODUCTION

State Islamic schools in Indonesia are always interesting to study. The emergence of Islamic state schools provides a significant comparison with private schools. The perception of the Indonesian community toward Islamic state schools is also varied. Some argue that Islamic state schools lag in curriculum, teaching, and the quality of their buildings [1]. This negative perception emerged alongside the proliferation of private schools in Indonesia that have significant and magnificent buildings [2]. Furthermore, based on research conducted by Kusaeri [3], it is stated that parents tend to want to enroll their children in expensive private schools. The choice of expensive schools is based on aspects of the learning system that are considered better, the welfare of teachers, which enables them to focus on teaching, and the attention given by the school to students [4].

The emergence of various juvenile delinquency cases in public and state Islamic schools makes parents reconsider enrolling their children in government institutions [5]. However, government institutions have lower costs than private schools [6]. The government provides good facilities for its students [7]. However, this cannot make public schools surpass private schools regarding facilities, achievements, and student outcomes [8], [9]. Diversity in academic achievements raises many questions, whether the learning

system, teacher recruitment, and textbooks used differ, resulting in significant differences in outcomes [10]. Even after the emergence of Islamic state schools that have achieved outstanding academic achievements in recent years, parents still prefer expensive private schools [11].

Some of the Islamic state schools that have achieved outstanding academic achievements in Indonesia are MAN IC Serpong, MAN 2 Malang, and other state Islamic schools. However, in the general public's view, state Islamic schools are still considered unable to surpass other private schools [3]. Parents consider private schools that use international labels with very high fees better. Parents feel more at ease when enrolling their children in expensive private schools [12]. In their view, there is no bullying, discrimination among peers, and gaps that lead to juvenile delinquency in expensive schools. Compared to Islamic state schools with a boarding system, it is undoubtedly riskier for negative actions to occur during their children's education [13].

The researcher examines how the Indonesian community perceives Islamic state schools in this research. The researcher's data consists of randomly collected Twitter posts using the Orange data mining application [14], [15]. The data used from Twitter consists of 300 posts collected using the Orange data mining application [16]. The researcher used the keyword "madrasah negeri" to search for the data [17]. Using the Orange data mining application made it easier for the researcher to analyze the community's sentiment towards Islamic state schools on Twitter [18], [19]. Although many applications can be used to analyze community sentiment on Twitter, the Orange data mining application was chosen by the researcher for this particular study [20]. The Orange data mining application is considered a more straightforward tool for data analysis than other applications available for sentiment analysis on Twitter [21]. Orange data mining is known for its user-friendly interface and ease of use [22], [23]. The collected data was analyzed using Orange data mining to examine the words that appeared based on those used on Twitter [24], negative-positive sentiment, and its frequency [22], [23], [25]–[27].

2. RESEARCH METHOD

2.1. Connecting Twitter with Orange data mining

Orange data mining is a freely accessible software used for data analysis. Data mining makes researchers' performance easier because data extraction is done using a system. In addition, analyzing collected data also uses applications to compute them. Connecting Twitter with the Orange application is easy. In the initial stage, the researcher must log into the Orange application and open text mining. Users can find various data sources in this section, such as Twitter, Wikipedia, PubMed, and NY Times. However, the Twitter application is the preferred choice for researchers because users often comment on anything in Indonesia. To obtain the Twitter application programming interface (API) key, users can take the following steps, see Figure 1.
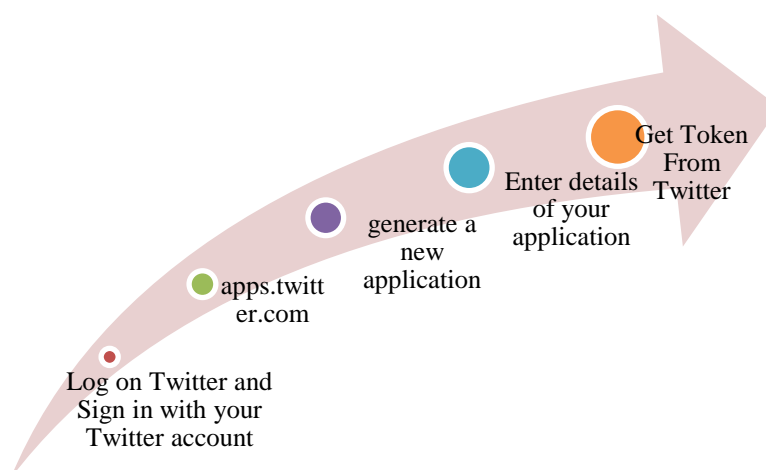

Figure 1. Get the API key from Twitter

2.2. Collecting data from Twitter

After obtaining the API key, users can log into the Orange application and select "Twitter" in the text mining section. Then, for the first time, users will be prompted for the API key, which can be obtained

by requesting it from Twitter App Developer [28] and then creating an app [29]. After agreeing, users can start requesting the API [30]. Then, users must wait for the developer to send the Twitter API key [31]. After obtaining the API, users will enter it into the Twitter icon section in the Orange application. Next, after entering, the user can enter the query list for the keywords they want to search for in the Twitter application [32]. The search can be selected based on several aspects, such as content and author. The amount of search data can also be adjusted according to the user's needs. In this case, the researcher enters the number 300, which means the maximum data searched on Twitter.

2.3. Sentiment analysis

This article examines public opinion on Indonesia's Islamic state schools. The emergence of Islamic state schools in Indonesia continues to experience development and change. However, only some are aware of the changes in education in Islamic state schools, so the public tends to have opposed opinions. Sentiment analysis aims to gain insight from public comments on social media. Researchers can decide on public opinion towards a searched keyword based on the results of the Orange application analysis. Here are the steps to analyse data using the Orange application, see Figure 2.
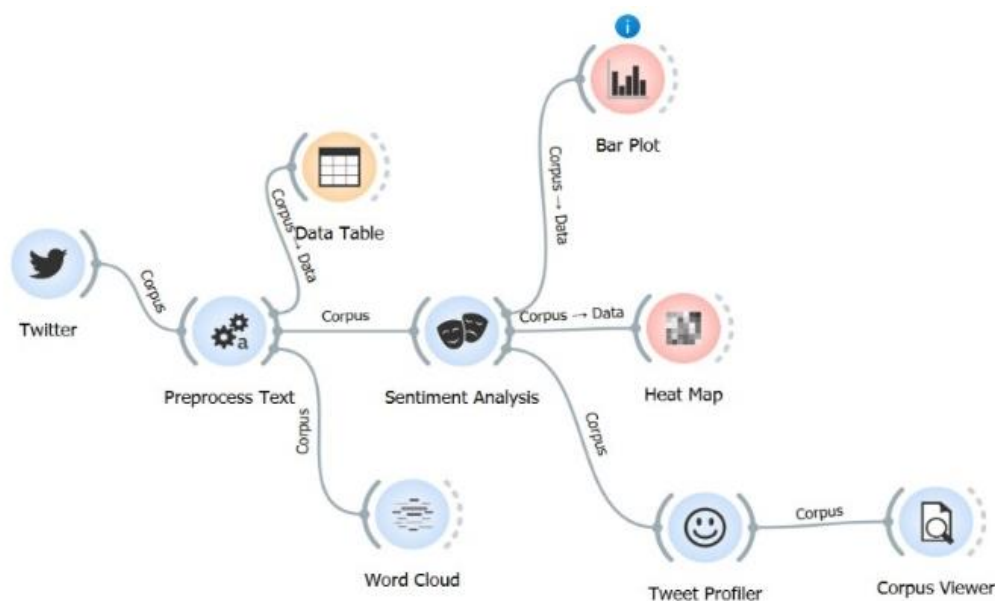

Figure 2. Orange application usage flow

3. RESULTS AND DISCUSSION

Based on the research conducted by the researcher, several opinions from the community regarding madrasah schools were found. The public's view on state-funded madrasahs varied greatly. Some believed that state-funded madrasahs were good places for learning as they integrated religion and education. However, some believed that all schools, whether state-funded madrasahs or general category schools, tended to have shortcomings in their teaching methods. Figure 3 shows the results of the analysis using the Orange application.

The data in Figure 3 shows the diverse responses of the community towards state-funded madrasahs. These responses are classified into several emotions: anger, fear, disgust, happiness, sadness, and surprise. The range of the evaluation varies from anger to surprise, which is -2.108 to 3.383. In addition, various responses using a word cloud also appear as shown in Figure 4.

The text in Figure 4 shows the various perspectives of the Twitter community towards state-funded madrasahs. Some words refer to cases of sexual violence, bullying, and requests for help. This means that the text indicates the community's discomfort towards state-funded madrasahs. From these findings, relevant institutions can anticipate providing more pleasant services in madrasahs.

The data set in Figure 5 was taken using the Orange application and obtained 300 tweets, which became data in this study. The Twitter accounts that are the goal of netizens belong to the Ministry of

Religion and the Ministry of Education. The purpose of netizens commenting on these Twitter accounts is dissatisfaction with the government's performance in education.

The data analysis using a bar plot in Figure 6 shows that the positive sentiment reaches a score of 20, and negative sentiment also appears with a score of 20. This means that the community has a two-sided view of both positive and negative madrasahs. Although from the data above, positive sentiment dominates more than the negative sentiment that arises.
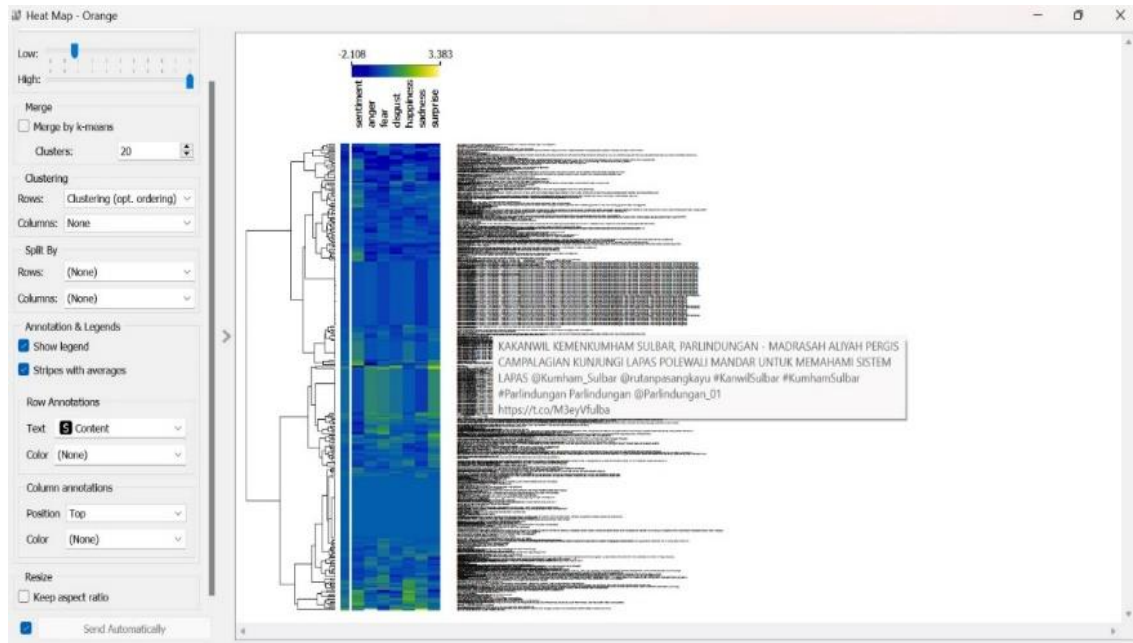

Figure 3. Heat map sentiment in society

Figure 4. Word cloud state madrasah

The data in Figure 7 shows that four accounts comment on the madrasah. The first three accounts commented on the madrasah's performance, with statements still in the excellent category. However, one other account, @pedescilor, gave the most negative comments. One of the accounts taken by the researcher shows their dislike towards government institutions, particularly regarding school management. Private schools that the government does not facilitate can proliferate. However, state-funded schools have lower education quality compared to private schools. From these results, it is found that public trust in state-funded schools has shifted in recent years. The decline in the image of state-funded schools is based on various cases, such as sexual violence, bullying, and discomfort in learning.

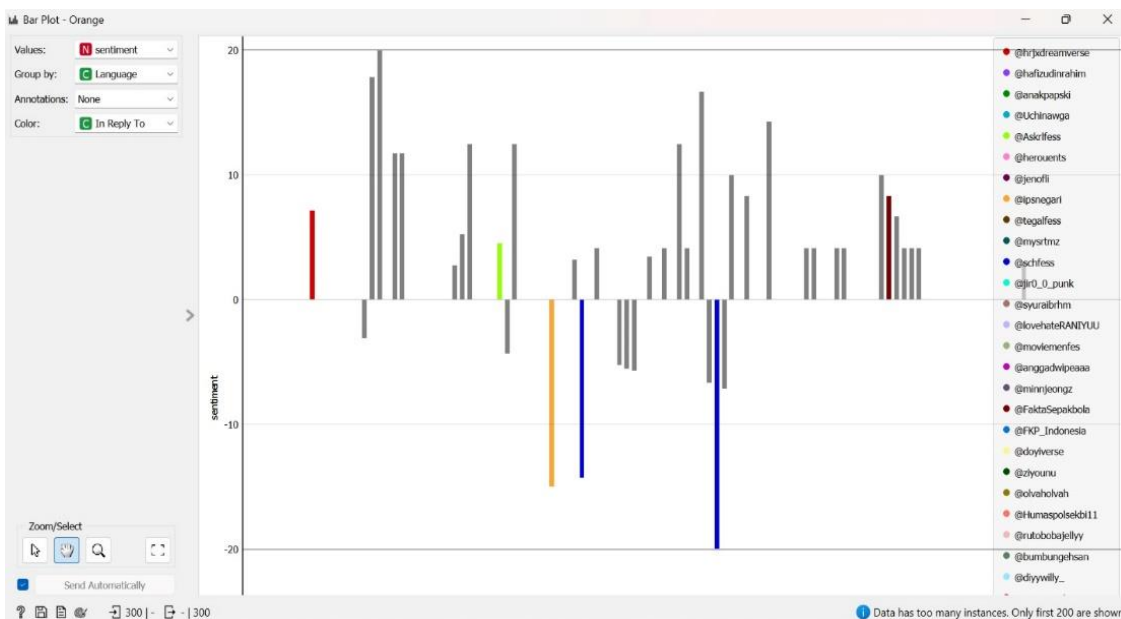Figure 5. 300 data collection

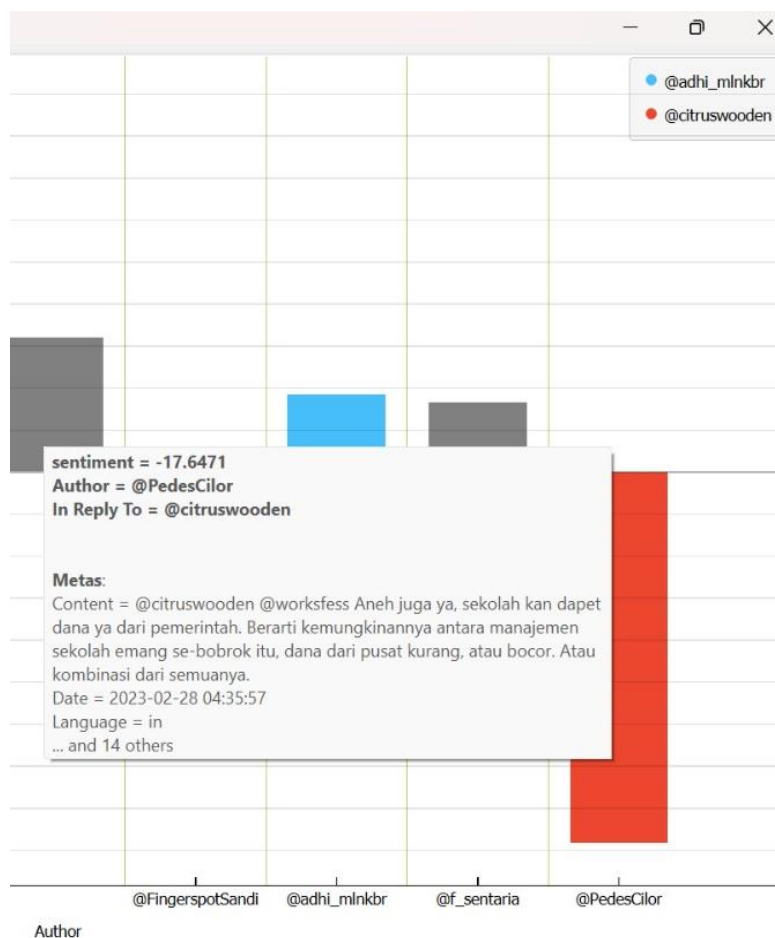Figure 6. Bar plot-sentiment analysis

Figure 7. Bar plot-sentiment analysis

4. CONCLUSION

State-funded madrasahs are still considered inadequate by Indonesian society. The community has two opinions, namely, positive and negative. Although positive sentiment dominates more than negative sentiment, the image of state-funded madrasahs should not have a negative sentiment. From this research, relevant institutions can use it as a reference to improve management in state-funded madrasahs. Improvement in the management of state-funded madrasahs is expected to dominate the image of state-funded madrasahs compared to private schools.

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