

Social network analysis of the development of the halal industry in Indonesia

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ABSTRACT

This study looks at the public sentiment of Twitter users regarding the halal industry. Data was taken using Drone Emprit Academic, an extensive data method that captures and analyzes conversations on social media, especially on Twitter, developed by Media Kernels Indonesia, which is also installed on the Information System Agency of the Islamic University of Indonesia. The research method uses a social network analysis approach to analyze data on social media conversations. The data was obtained after observing for 30 days from trending Twitter topics. The data is processed by the Social Network Analysis (SNA) system, which can be interpreted as describing the interactions and relationships that always occur between one individual and another in an organization or work environment and the company. We found that the halal industry in Indonesia is growing more rapidly with the existence of social networks. A large number of conversations among Twitter users in Indonesia shows this.

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1. Introduction

Halal Industry refers to processing goods and services using methods and tools that comply with sharia [1]. Currently, halal products and enterprises are a religious problem in the Muslim community and a way of life [2]. Indonesia, which has a larger Muslim population than other nations, has not developed its halal business effectively [3]. The Indonesian market is quite promising. The halal industry is currently a global trend. In this scenario, it is evident that the potential for the halal business increases from year to year [4].

The existence of the halal industry cannot be separated from the existence of a structured movement through social media [5]. Conversations about the halal industry influence public opinion in determining lifestyle decisions with the halal industry or others [6].

The development of information technology is the development of a system that is very concerned with the ease of internet access and speed because there are now numerous digital sources circulating on the internet [7]. It can track aspects of daily life that are inextricably linked to digital technology. With the following terms, social media has become necessary for the public, dramatically altering the social landscape and how participation is understood. The application of accurate and proportionate information technology to software (platforms) and software (operating systems) continues to offer numerous benefits to the community [8].

All scientific disciplines anticipate the effectiveness and efficiency of an information system's performance due to its practical advantages. In addition, the recent rapid development of digital issues has strengthened the public's understanding of its role. The data is then used for various channels of participation that are classified as reading the public opinion that develops within a society.

Consequently, a tool is required to detect in detail the analysis conducted by netizens in software application conversations [9]. In this study, we will present the functions of the Drone Emprit Academic (DEA) application developed by the Islamic University of Indonesia in light of current trends among internet users. This study will describe the usage of keywords in the Halal Industry in Indonesia, which has become a topic of conversation among netizens on social media, particularly on Twitter. Drone Emprit provides vast data to discover actual social. According to the study, Drone Emprit Academic is an extensive data system that records and analyzes social media, particularly Twitter chats [10].

Using the streaming technology, Drone Emprit already uses a Twitter-integrated API (Applications Programming Interface) service to capture talks in near-real time. Twitter displays trending percentages, retweets, and graphs, with retweet status and conversations taking precedence [11], [12]. The data as a reference can only be read/viewed for the many types and social phenomena that occur. This study has limited the capability of the Drone Emprit Academic application to scan public debates on social media using the phrases Halal Industry [13].

In this DEA application, researchers will perform a study using a Social Network Analysis method frequently employed by academics and researchers, including professors, teachers, researchers, and students [14]. Examining the network patterns in which organizations, ideas, and people interact in various ways, SNA has various network features that give relationships that aid in the development of information management [15].

2. Method

In this study, descriptive qualitative methodology is employed [16]. A case study is the qualitative research method employed in this study. In this context, a case study is a qualitative research method purposely designed to generate and discover novel processes or behaviors as a research object that is not well recognized [17]–[19]. The Drone Emprit Academic application has been the subject of research in reading citizen conversations in social media with the Twitter application for the last 30 (thirty) days, beginning on 3 (three) August and ending on 1 (one) September. In contrast, the data analyzed in this study were collected from 3 (three) August to September 1. The research presented here takes the form of citizen conversations around the Halal Industry in Indonesia. Social Network Analysis (SNA) from the Drone Emprit Academic (DEA) of the Islamic University of Indonesia was utilized to collect data on their talks using data collection techniques [20].

The tracking process of conversations by netizens goes through several stages: One, it can analyze the entire cluster of netizen conversations that are adjusted to the keywords Halal Industry. Second, conversations with netizens are very determined in the period. Third, we quickly analyze keywords through Social Network Analysis (SNA) and then describe them based on influencers, buzzers, and followers. Fourth, we can select conversations based on the number of retweets, mentions, user accounts, and hashtags used. Fifth, it can determine the percentage of the bot (robot) accounts in the conversation. Sixth, identify the most shared sites. Finally, determine which regions the netizens who participated in the conversation came from [21]. The algorithm of the data flow can be seen in Fig. 1.

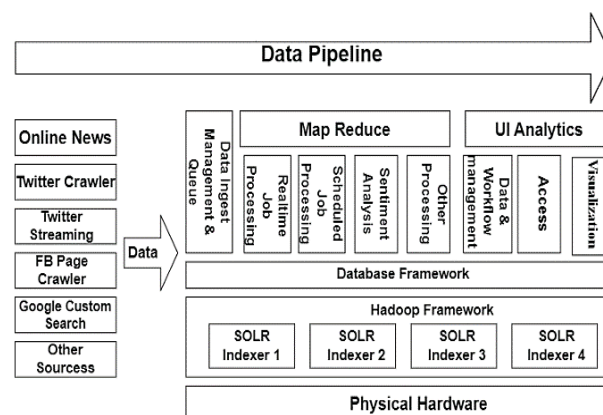


Fig. 1. Algorithm of the data flow

3. Results and Discussion

Drone Emprit Academic discovered 5,585 active Twitter social media users discussing the Halal Industry. We discussed the Halal Industry on Twitter between August 3 and September 1, 2022. The data comes exclusively from social media platforms, not news websites. This finding indicates that internet users are highly enthusiastic about the topic. The following discussion will outline the specific analysis of the various chats.

3.1. Mention Analysis

Twitter users continue to engage in heated discussions about the Halal Industry in August 2022. With 787 tweets on August 17, 2022, the topic of the Halal Industry reached its highest point in August. There was no conversation from August 18-22. The conversation about the Halal Industry resumed on August 23 and peaked on August 25, 2022, with 451 tweets. After two days, the conversation topic began declining on the 27th, when only 127 tweets were posted about it. This Halal Industry discussion will experience daily ups and downs until September 1, 2022. Fig. 2 shows the trends of total mentions by media type.

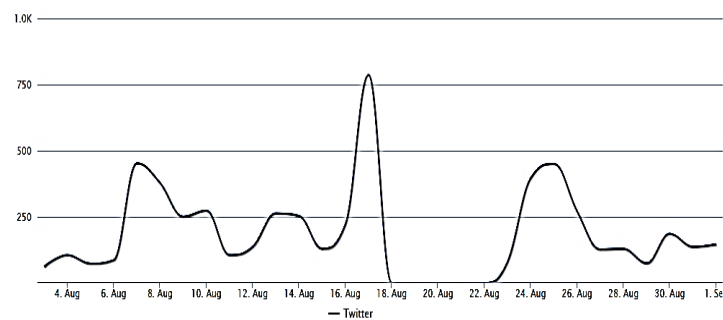


Fig. 2. Trends of total mentions by media types

Fig. 3 shows that Drone Emprit Academic discovers daily Twitter activity about the Halal Industry. From Monday to Wednesday, the Halal Industry is frequently discussed and has increased in frequency on Wednesday. Monday, as many as 584 Twitter users discuss this subject. As a result, as many as 1,656 Twitter users discussed this subject at its highest point on Wednesday. From Thursday to Saturday, the number of Twitter users discussing this topic decreased from 810 to 477. Finally, as many as 837 Twitter users discussed this topic on Sunday.

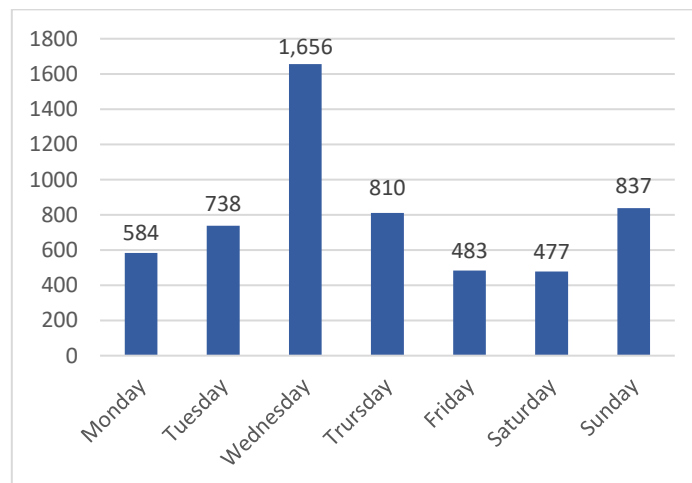


Fig. 3. Mentions by day

We compile an analysis of Twitter users' hourly Halal Industry-related conversation mentions. Similar to midnight or midnight, 113 Twitter users were discussing this topic. However, only 48 Twitter users talked about the halal industry at three o'clock, but by nine o'clock, that number had risen to 483. In addition, the conversation is declining, possibly because everyone is engaged in activities such as work, school, or college during working hours. Fig. 4 shows mentions by the hour.

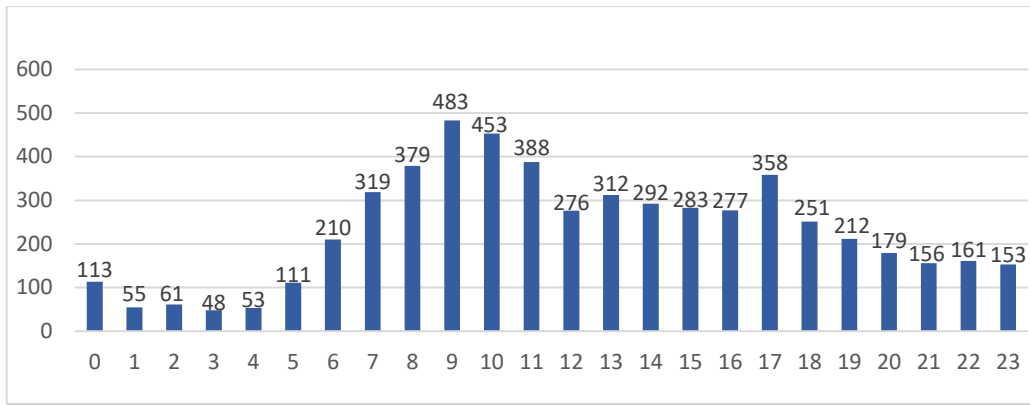


Fig. 4. Mention by hour

We analyze engagement types. Fig. 5 shows Twitter users' total mentions, replies, and retweets. As a result, from August 3 to September 1, 2022, the number of tagged or tagged someone's account in conversations or comments on halal Industry topics reached 973 accounts (17.42%). Responses given to other people's Tweets reached 746 accounts (13.36%), and (retweets) reposted a tweet of up to 3,866 accounts (69.22%). The total number of mentions, replies, and retweets on the Halal Industry on Twitter is 5,585 active Twitter accounts. At the same time, the level of interaction on this topic is 4.74.

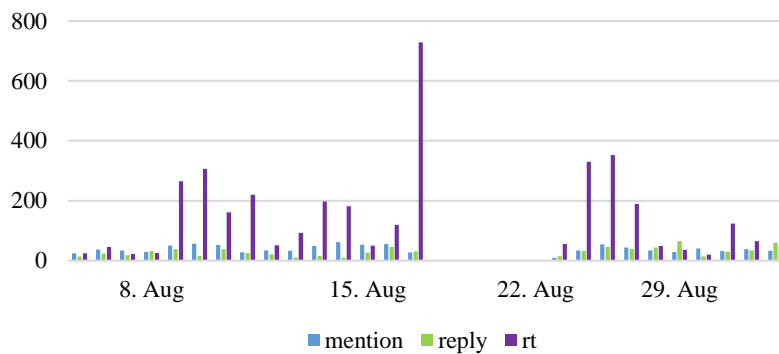


Fig. 5. Total daily rt, reply, and mentions

The exposure captured by the Emprit Academic Drone application analyzes Twitter followers and posts from followers on topics discussing the Halal Industry. Starting from Twitter followers 0-3 posted (tweets) of 296 (5.30%), Twitter followers from 4-25 posted (tweets) 450 (8.06%), Twitter followers from 26-50 posted (tweets) 297 (5.32%), Twitter followers 51-100 tweets 410 (7.34%), from 101-500 Twitter followers his posts (Tweets) 1,672 or (29.94%), Twitter followers from 501-1000 his posted (tweets Hence, the sum of all of the postings (tweets) made by all of the followers is 5,585, which is equal to 100%. Fig. 6 shows the total exposure.

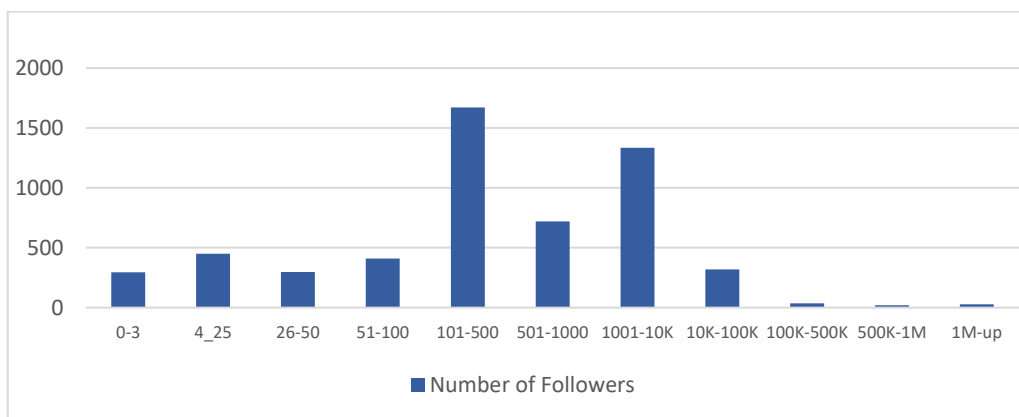


Fig. 6. shows the total exposure

3.2. Sentiment Analysis

We analyzed sentiment from August 3 to September 1, 2022, resulting in harmful, positive, and neutral comments. Many netizens participated in mentioning the topic of the Halal Industry. There were also unfavorable remarks or answers from netizens, with as many as 1,895 or 34% of mentions. Most netizen responses were positive, with 3,460 or 62% of mentions. Meanwhile, those who responded neutrally were 230 or (4%) mentions. In total, 5,585 netizens participated in the Halal Industry topic. Fig. 7 to Fig. 8 shows the total mentions and share of voice by sentiment.

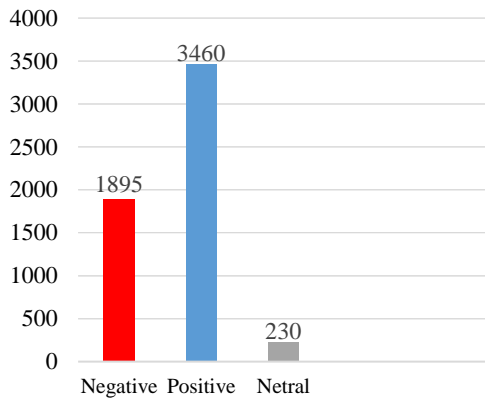


Fig. 7. total mentions by sentiments

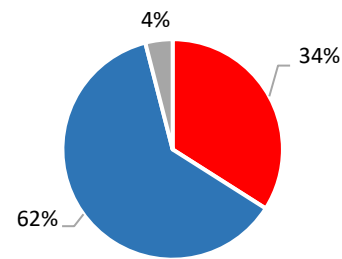


Fig. 8. share of voice by sentiment

As shown below, we analyze sentiment by day and comments that lead to pros and cons. On Monday, there were 584 mentions. Blue commented positively on 301 netizens, and in red, 267 negative comments. Next was Tuesday, where netizens commented more positively, as many as 503, negative 154, and neutral 81. The highest peak of netizens commenting on Wednesday was 1,656 mentions, 695 positive comments, 863 negative, and only 98 neutral. From Thursday onwards, positive comments are always the most on the following day, like Thursday, and there are 677 positive and negative comments, only 118: Friday positive 322 and negative 152. On Saturday, there were 400 positive, 74 negative comments. On Sunday, 562 commented positive and 267 negative comments. Fig. 9 shows sentiment by day.

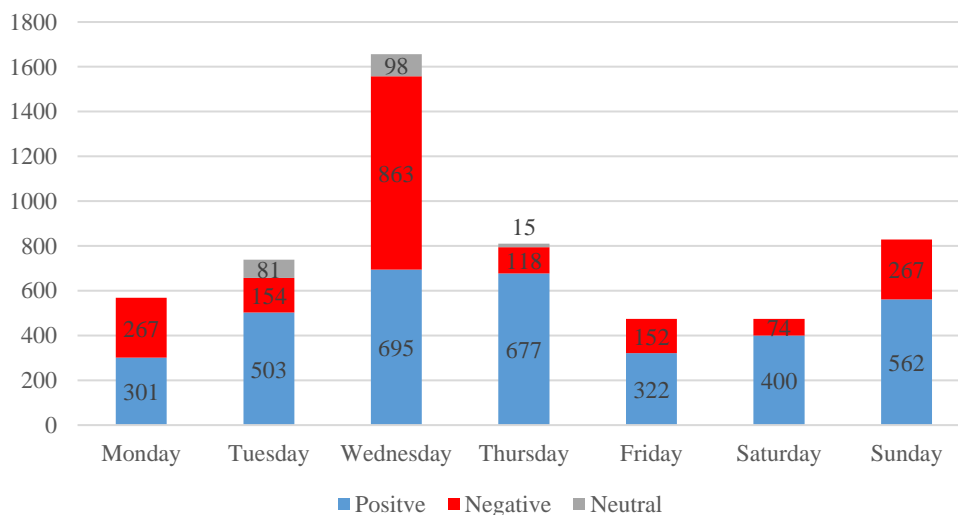


Fig. 9. Sentiment by day

In the middle of the night, at 00:00 or 12 pm, netizens gave 80 positive comments and only 28 negatives. At 04:00, positive comments dropped to 33 and negative ones only 17 comments. At the peak of commenting at 09:00, there were 239 negative comments, 231 positive and neutral comments,

Twitter accounts greatly influence the halal industry conversation on food and tourism accounts. Fig. 12 shows the top influencers, including @yozariam, @H_Bakkaniy, @MalaysianFoods, @pmbrutiketmurah, and @MNW_MNW_MNW. In other words, the account is lighter to attract the participation of netizens to provide comments with the theme of the Halal Industry, which has various discussions ranging from Muslim clothing to halal food.

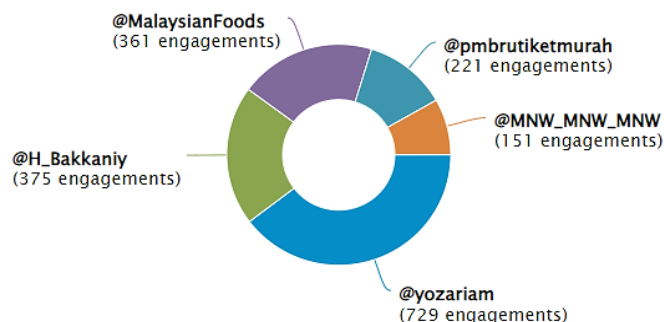


Fig. 12. Top influencers

In the conversation, it is known that the bot account shows 998 authors (73.60%) with a bot score of 0-1. That is why in the conversation that discusses the halal industry, it is natural that it is sourced from netizens, not because of robot accounts. Table 2 shows the results of the bot analysis.

Table.2 Bot score

Bot Score	Authors	Authors (%)	Posts	Posts (%)	Retweeted	Mentions	Replies
0 - 1	998	73.60 %	1,178	72.94 %	895	169	114
1 - 2	218	16.08 %	254	15.73 %	196	35	23
2 - 3	83	6.12 %	104	6.44 %	74	21	9
3 - 4	40	2.95 %	44	2.72 %	28	10	6
4 - 5	17	1.25 %	35	2.17 %	5	25	5

3.4. Demography Analysis

Of the 4,166 active accounts, it was found that millennials aged 19-29 were very highly engaged in this Halal Industry-themed conversation or 50.51%, 49.94% of posts were tweeted, 644 tweets were called 94 times and reposted (replies) 77 times. While 31.38% of 18-year-olds use Twitter and are involved in this theme, there are 505 posts tweeted, 399 tweets mentioned 57 times and reposted (replies), and as many as 49. The identified authors were 1,380 or 33.13%. Table 3 shows demographics by age.

Table.3 Demography by age

Age Group	Authors	Authors (%)	Posts	Posts (%)	Retweeted	Mentions	Replies
18	433	31.38 %	505	30.94 %	399	57	49
19-29	697	50.51%	815	49.94 %	644	94	77
30-39	116	8.41 %	140	8.58 %	95	28	17
40	134	9.41 %	172	10.54 %	77	78	17

We found the types of users in this Halal Industry topic Twitter application. There 90.29% of authors with non-org user types, while 9.71% with organizational user types. Table 4 shows demographics by user type.

Table.4 Demography of user type

User Type	Authors	Authors (%)	Posts	Posts (%)	Retweeted	Mentions	Replies
Non-org	1,246	90.29%	1,380	84.56%	1,120	120	140
Is-org	134	9.71%	252	15.44%	95	137	20

Table 5 shows that 63.26% of men and 36.74% of women were in this Halal Industry topic conversation, with men posting 65.44% and women 34.56%. It resulted in 766 tweet retweets, 184 mentions, and 118 reposts for the male gender. Meanwhile, women retweeted 449 tweets, referred to them 73 times, and reposted 42 times.

Table.5 Demography br gender

Gender	Authors	Authors (%)	Posts	Posts (%)	Retweeted	Mentions	Replies
Male	873	63.26%	1,068	65.44%	766	184	118
Female	507	36.74%%	564	34.56%	449	73	42

Based on this demographic data, it is known that the generation aged 19-29 with non-affiliated status in organizations and the male gender is the largest producer of tweets about the halal industry in Indonesia.

4. Conclusion

A total of 5,585 Twitter social users discussed the topic of the Halal Industry. The peak of the discussion was on August 17, 2022. Before that date, the conversation on this topic experienced daily ups and downs. Wednesday's mentions were the highest at 1,656 Twitter users. One day there are 24 hours, while at 09.00, the topic is discussed by as many as 483 Twitter. The Top Hashtag is found on the #BangkitSemangatET account, which has 722 tweets. The top influencer on Twitter accounts, the most influential related to Halal Industry conversations, is @yozariam 729 engagements. In the Sentiment analysis, netizens responded positively rather than negatively, with 3,460 positive mentions from 5,585. Analysis of emotions, anger, and trust are dominant on this topic. The netizens' location in this topic's distribution in Indonesia is relatively even, not in Eastern Indonesia. This conversation is less desirable. Millennials aged 19-29 are interested in the Halal Industry, while older people are only slightly interested. SNA (Social Network Analysis) looks at @yozariam accounts and @H_Bakkaniy many negative cluster influences, while @MalaysianFoods and @pmbrytiketmurah have positive clusters.

This study has the limitation of only using Twitter as the primary data for analysis. In the subsequent study, researchers can use data sources from other social media covering not only one country.

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