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The Urgency of Actors' Presence on Trending Hashtags on Twitter's New Media in the Frame of Social Network Analysis

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Abstract

The phenomenon of using social media as a new media to meet the needs of information in the community is the result of the rapid development of the internet. Now the needs of the community are easily met, because various things have been contained in it. This can be analyzed based on the phenomenon of trending topics through hashtags on social media twitter using Social Network Analysis (SNA). The purpose of writing this research article is that with so many soap operas in Indonesia that last more than one year on the Indonesian screen, it becomes an interesting thing, but it is not only in the real world, but has become a conversation in cyberspace, Twitter in particular. Using mixed method research methods with actor and network analysis techniques in the quantitative and technical domains of observation, record and descriptive analysis techniques, with Bruno Latour's network study approach. The subjects of the study were the network of actors and the flow of information on the hashtag #IkatanCintaEp1012. The use of Twitter social media as a new media can show networks and actors that make the spread of information and connectivity between fans in the virtual world increasingly stronger and faster in a hashtag network.

Introduction

The emergence of new media or New Media is a new chapter in technological developments in the world. Law in (Priyatma, 2013) explains the concept of the first 'actor-network' conceived by Michel Callon, Bruno Latour, and John Law in the 1980s. Using the metaphor of actor networks, the ontological assumption used by Actor Network Theory is that reality (social, organizational, technological) is all merely the result or result of a relationship between different types of entities. According to Latour, the central topic is not micro agents or macrostructures, but social processes related to the entities within them.

Actor network theory has properties that are ontologically different from other networks. Actors in theoretical terminology are not just nodes in the network, but actors also give birth to actions through interactions between them in the network (Arditama, 2016). Networks are actions generated by the interaction of actors. The urgency of the existence of actors in new media can be seen in new media twitter which has a trending hashtag feature. Hashtags are crucial in facilitating and energizing conversations on Twitter (Collins et al., 2019; Losh, 2019). They serve as digital instruments that gather and link together content concerning a particular subject or matter (Saeed et al., 2023). Today's media landscape encompasses not only the conventional influential figures such as politicians, journalists, and academics but also includes everyday social media users, grassroots campaigners, and activists who may not hold elite status (Chen et al., 2023). In placing actors owned by the new media, that is, actors act as individuals who are active in using and utilizing trending hashtags. The capacity for a hashtag's broad reach stems from the way Twitter is structured (Dadas, 2017), although Conversations

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on Twitter are rapid and lack a formal structure, leading to increased interest from both practical users and academic researchers in the organizational utility of hashtags (Giglietto & Lee, 2015). Twitter is a popular social networking platform utilized by individuals to share information. The rapid and comprehensive dissemination of information on Twitter occurs through user-generated posts. Content shared by Twitter users is publicly visible and can be redistributed by others through the retweet function (Mulyani et al., 2022). Twitter serves as a vast, continuously updating platform that functions as a live laboratory for analysing both content and network dynamics. Analysts have the ability to not only observe the content produced by users but also track the engagement with that content, including direct responses, retweets, and likes (Oates & Gray, 2019; Gavilanes et al., 2018; Mameli et al., 2022). This has great relevance to the rise of the world soap operas in Indonesia, for that it is often soap operas Live streak in hundreds of episodes. This makes multiple stations television and production houses compete to produce soap operas that can be aired at prime broadcast time in order to get high ratings and shares (Nandaryani & Santosa, 2019).

This shift underscores fundamental challenges and consequences at the core of existence, as hyper-connectivity is no longer a choice but an essential condition ensuring social presence in today's age. The prevailing axiom of this era—"My existence is validated by my presence on social media"—shapes the fundamental condition of existence for the digital native generation. For this demographic, the combination of their physical presence, smartphone usage, internet access, and engagement on social media platforms defines both their individuality and their sense of belonging to a collective. Put differently, their social existence, both as individuals and as part of a larger group, hinges on their digital interconnectedness (Yun, 2020). The existence of actors becomes an important thing, because with the interactions and actions carried out by actors ultimately form wider networks, for example, the network of Twitter users who use the hashtag on the Twitter platform, as well as the network of actors in it with each other, when associated with Relations with Technology owned by new media Networks here are not fixed channels and finalized, and has no pre-established nodes (Dehghan, 2020; Alaimo et al., 2020).

The meaning of network here is also different from the meaning of network in terms of social networks in social theories. In the study of social networks, attention is paid to the social relations of individuals (human actors) frequency, distribution, and homogeneity of these relations (Kluger et al., 2020). The attention of network actor theory is focused on heterogeneous relations that include non-human entities, technological and natural objects (Vitale et al., 2020).

Actor networking is an ontological concept that refers to a phenomenon of becoming how something becomes productive effects. According to actor network theory, social agents are never located in bodies or bodies alone, but are networks heterogeneous relations which is patterned, or is an effect of networks like this (Martomo, 2020). When an actor becomes a star in a network of technology and new media, he is a central actor in a network that can be known using network analysis. Actors involved in transding topics using hashtags form networks that ultimately create network circles connected to lines of interaction that connect one another (Tayibnapis, 2021). The urgency of actors is very important to note, because there will be patterns formed, to be able to answer every question related to existing problems. In communication networks there are several sizes that are often used, in First, Density: Measures the ratio of the number of links (ties) in a network with the number of potential links that exist. Density indicates the strength of interaction between network members. Second, Size refers to the number of actors (nodes) or members in a network.

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Reciprocity is the ratio of bidirectional links to total links in a network. This value indicates whether the relationship between actors (nodes) occurs bidirectionally or only from one direction. Fourth, Centralization measures the size of the network center contained in several actors (nodes) and fifth, namely Diameter (Distance) is the farthest distance between two actors in a network. Distance is the average number of steps or paths that all actors need to communicate (Utami et al., 2021).

The core idea of network theory is to trace the role of human and non-human actors in acting or inspiring others to act as mediators to create some network form (Sayes, 2014). Analysis using network theory will be divided into 4 phases, namely Problematization, Interessement, Enrolment, and Mobilization, Problematization is the phase where problems are identified and how the problem was resolved. Obligatory points of passage will also be identified, namely the objectives to be achieved and mutually agreed upon, Interessement, which is a phase to identify how to invite and make other actors interested, in Enrollment The enrolment phase will be analyzed related to acceptance from the community and how things are done when the community is interested/interested in the implementation of information and communication technology, the last is Mobilization, namely the mobilization phase, which will be analyzed how the sustainability of information technology implementation (Alfandya & Wahid, 2021; Mohamad Hsbollah et al., 2015).

For this reason, in this study will be explained the analysis of networks and actors on the #IkatanCintaEp1012 hashtag trending, because this is a unique thing, various conversations related to soap operas are still brought into the new media Twitter by fans, with it proven that soap operas have existed for more than 1000 episodes in a period of more than one year of airing on the small screen.

Methods

This research employed a mixed research design that entails both the quantitative and the qualitative methods of data collection and analysis with much emphasis being laid on the actor and the network methods. The research question of this study was to look at the communication, the actors behind the Twitter hashtag #IkatanCintaEp1012. Thus, the method of Social Network Analysis (SNA) was used to visualize the relationships of users, find out the flow of information and the impact of interaction on the formation of the network. Using this methodological context, it was possible to analyze not only the message content and the specific symbols used in the communication, but also the structural characteristics of the network that allowed to discuss the general effects of using this hashtag in the context of the Indonesian soap opera, Ikatan Cinta.

The research focused on two primary elements: Which, in effect defines the object and subject of the study. The research object was the network generated around the hashtag #IkatanCintaEp1012, which includes the data connected with the soap opera on the Twitter platform. What I found relevant is that the hashtag acted as a sign therefore allowed the users to be part of the conversation. As for the actors of the study, we were speaking about those users, who actively included the hashtag into their messages. These actors engaged in activity such as tweeting, retweeting, liking, and replying hence creating the relationships that comprised the network. Both of them were crucial in identifying the patterns of how the discussions regarding Ikatan Cinta flowed in the Twitterverse that formed a communication and can be mapped out using SNA.

In data collection, this study used the Netlytic. org platform so as to get more information on the activities of the Twitter account pertaining to the hashtag #IkatanCintaEp1012. This

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involved capturing tweets with the hashtag as well as capture the engagements with the twitter handles; mentions, retweets and responses. Network analysis requires data to be formulated in a way that Netlytic enabled a structured extraction of data. The collected data were analyzed with the help of Gephi software which is used for display and analysis of network data. With the help of Gephi, relationships between users were shown as well as the distribution of information which helped the researchers depict the network architecture in graphical manner. The process of visualisation was an important part in establishing which actors dominated the network and how information flowed through the network.

The analysis of the collected data proceeded in three key stages: as the reduction, presentation, and conclusion drawing were concerned. First in the reduction stage all irrelevant information like promotional tweets or those not following the soap opera theme were eliminated. This meant that the research only concentrated on substantive collaborations by actors who interacted with the #IkatanCintaEp1012 has tag. Once cleaning was done, the second process in the data analysis process was data presentation of the filtered information. As shown in figures 3, 4, 5 and 6, these results were achieved by using the tools available in Gephi and Netlytic to represent metrics such as density, reciprocity, centralization, and modularity. These metrics gave the quantitative picture of the network and identity of strongly connected nodes, communication flow and the identity of powerful players in the network. The third and the last step was made after analyzing the gathered data and was the conclusion of the study. These findings were analysed within the conceptual lens of Bruno Latour's Actor-Network Theory (ANT) where the main focus is on the connection between the actors and how those connections form the network.

Result and Discussion

In this research, the communication network and actors specifically regarding the Hashtag #IkatanCintaEp1012 on the Twitter platform were considered. The data was collected through Netlytic while the visualizations and the network structures were assessed through Gephi. The results illustrated the patterns of individual actors' behavior, structure of the communication network, and temporal patterns of information exchange.

Network Density and Interaction Strength

The first aspect examined was the density of the network and this is the extent of interaction between the actors. The density value was 0 The total number of articles is 419 Total Articles = 419 This means the relations between the actors in the network is weak, consistent with the interaction intensity score of 0.008168. This implied that although the large number of men and women used the hashtag, relationships between a proportion of the two extant participants were limited to limited levels of interactivity. The majority of users posted information without many connections between them meaning that they did not communicate intensely in closed groups.

Table 1. Network Density

Metric	Value	Interpretation
Density	0.008168	Low density, weak interactions between users

This low density indicates that, though the number of actors in the network is high, a limited number of them are communicating and exchanging information with each other, hence diffusion of communication.

Density or density is a measure of the intensity of communication that occurs between nodes in a communication network contained in the #IkatanCintaEp1012 which is 0.008168, if the

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density value is close to number 1 it indicates high communication intensity which means each node communicates to almost all other nodes on the network, with existing numbers, meaning the intensity of communication on the network is not high, which means many members of the community are not dominant actors, meaning low. The findings of cluster patterns seen in the network visualization are also supported by network structure measurement data in Figure 2, namely in Property centralization and modularity. In addition, there is also a reciprocity measurement, where if the reciprocity value is 1 it means that there is two-way communication between all nodes in a communication network, while in this hashtag 0.001493 is not tall in the interaction of two-way communication in it. A high centralization value, which is close to number 1, indicates that the interaction is centered on dominant actors. while if it is much lower than number 1, it means that the interaction is not centralized and influenced by dominant actors (Tjahyana, 2021). For this reason, in this Hashtag, by showing a number of 0.174200 means, the interaction contained in this hashtag is not centered on the dominant actor.

Then, for a low modularity value close to zero indicates that the community consists of a coherent group with the same conversation topic, but for a high modularity value close to 1, indicating that the community has been divided into groups or clusters with different topics of conversation and is also influenced by different dominant actors in each cluster, related to this, it shows that value from The #IkatanCintaEp1012 hashtag is low. For a diameter of 11 which means that 11 nodes are needed so that information can be conveyed between the farthest nodes, because the density is low, the time is longer for the distribution of information, if you see that the diameter value in the hashtag is high and low density it can be concluded that the fans do not know each other and come from different backgrounds, even though they don't know each other, the fans have the same passion and goal to support each other's favorite soap operas, this hashtag is used to identify themselves as fans of the soap opera Ikatan Cinta.

The low-density value obtained was 0. The FC value of 008168 attained in this study corresponds to a weak clustered network meaning that the fans are dispersed across the social network. Rainie & Wellman (2012) asserts that digital networks are often sparse for this reason because of the nature of the media platform like instant messaging and the twitter through broadcasting of messages. This is particularly so when the hashtags are used to categorise, or schedule the conversation, as it allows users to engage even if they do not have to interact with others directly as pointed out by Dadas, 2017. This is substantiated by our findings showing that while a large number of users participated in the hashtag, their activity was more or less self-centered and disconnected, in paraphrasing Eisenlauer (2013) work on the characteristics of online social networks.

Furthermore, the fragmentation of the #IkatanCintaEp1012 is quite typical, given the character of the large-scale networks, which is the fact that most of them often exhibit the “long tail” structure, where the nodes are loosely connected (Lafourcade & Joubert, 2012). This according to Newman (2010) is common with the fan-based networks which are more into the consumption part than the sustained conversation kind of thing. This can be seen with this dispersed network structure: it is probable that the massive audience of the soap opera in question does not directly engage with other fans of it, but they assist in maintaining the trending status of the hashtag in question through liking and retweeting it (Oates & Gray, 2019; Recuero et al., 2012).

Reciprocity and Bidirectional Communication

The density of the network was low at 0 Table 1 The mean number of ties per participant: out in the reciprocity of the network. Gupta A, 001493 also showed that most of the communication was one way. In other words, the majority of users were either sharing new posts or re-tweeting

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and getting no reply, etc. This might suggest the lack of two way communication that exists in the twitter, where people put out their opinions but do not necessarily get a chance to converse with other people.

Table 2. Reciprocity Measurement

Metric	Value	Interpretation
Reciprocity	0.001493	Low reciprocity, indicating limited two-way interactions

The low reciprocity ensuring that the communication prevalent on the site is characterized by broadcasting and not by mutual exchange between the users. The second type of reciprocity can be categorized by the following: No Individual value of reciprocity = 0 Finally, the result represented by 001493 also provides evidence that bidirectional communication was rather constrained, thus contradicting the idea of the one-directionality of Twitter. This observation differs with Sundstrom & Levenshus (2017) study that while twitter enables users to share information, it does not foster dialogic communication. The best explanation of this phenomenon can be viewed with the help of Choi et al. (2020) definition of self-presentations, according to which users choose purposeful public images online and tend to publish materials rather than to communicate. In the context of fan networks it may be paralleled to Sugihartati (2020) findings that fans are more often engaging with common media texts rather than in discussions. Still, as a result of fans' behaviour, passive participation, like retweets or likes, mean that the hashtag will gain exposure either way. This passive participation has been examined in works by Pavan (2020), pointing to the fact that social media allows a type of connective action which does not require one to actively engage with the programme, yet, they contribute to the collective goal.

Centralization and Dominance of Actors

The extent of centralization of the network was calculated as 0. 175200, which is still not as high as one might expect, given the nature of the social network more generally and especially when compared with more centralized social networks. This result pointed that the network was not overly tied by a particular actor or like-minded actors in the context. However, it has been noted that there were many influential users who gave equal contributions to the flow of information and did not dominate this. Various actors-maintained power in their respective clusters; otherwise, there was no leader of the discourse.

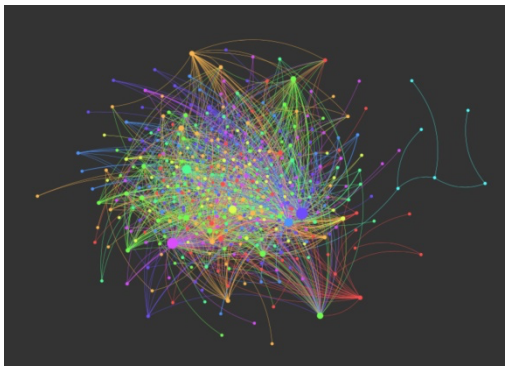

Figure 1. Network Visualization (Centralization)

Source: Gephi processed by Researchers 2023

What becomes clear in this visualization is that whilst some actors have more followers or tweets with more retweets, none is the central figure in the show.

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To calculate centralization a score of which is 0 for the present sample means that there existed a tight hierarchical control system. 174200 shows that here were some influential actors, however, the extremely centralized structure of the network where only one or few users controlled the majority of connections could be excluded. This leans with advances made by Xu et al. (2022) in his opinion leadership theory where he noted that influence in decentralised networks is dispersed with several actors having central roles. The chosen key actors like @andhinikharisma_ and @purplove_ also significantly contributed to the creation of discussions regarding the soap opera by creating the content which provoked retweets and comments. It is possible to explain their popularity using Chen et al. (2021) Diffusion of Innovation theory, according to which innovators, or rather the early adopters of the piece of information, are those who perform the core function of disseminating information.

Nevertheless, the structure of the #IkatanCintaEp1012 could not be compared to celebrity-oriented networks, for which a single actor may seize control (Marwick & boyd, 2014) the interaction model is most likely to correspond to a community-oriented one. This echoes observation made by Bruns & Burgess (2015) who pointed that based on hashtag, a greater number of people becomes audible. In the case of #IkatanCintaEp1012, this decentralization may have helped in encouraging fans to engage in several different discussions and so, bring some freshness into the hashtag, thus making it relevant in the long run. The occurrence of tweets consistent with the material of the soap opera popularized whilst using the micro blogging site, Twitter to connect fans from the two diverse backgrounds to support Jenkins's (2006) philosophy on participatory culture.

Modularity and Clustering of Conversations

The four modularity indices identified were modularity score of 0, modularity density of 0, normalized density of 0 and density of 0. 303 of them gave the idea that the network was moderately well-conned whereby different groups of users clustered together to from a separate cluster. This implies that though a majority of users focused on the topic of the soap opera Ikatan Cinta, they were engaged in different conversations hence, possibly users with likeminded interests in subgroups may have interacted based on their area of interest in the particular soap opera.

Table 3. Modularity Measurement

Metric	Value	Interpretation
Modularity	0.303	Moderate fragmentation, indicating the presence of clusters

The modularity value of 0. 303 suggests moderate fragmentation; thus, the network was formed by several clusters where the nodes were weakly interconnected. Thus, it strengthens the Luckett & Casey (2016) conclusion that hashtag networks can nucleate on specific conversational themes or fan clusters specific to individual 140-characters conversations. Here, this might be possibly due to the separate fan groups supporting different characters or events taking place in the show of #IkatanCintaEp1012. The relatively high diameter of 11 indicates that these clusters where not closely knit and information flow across the cluster was relatively slow where two nodes belonged to different clusters.

This finding is also related to Lave & Wenger (1991) concepts of communities of practice, where there is communion among fans by watching the same episodes or discussing the same storylines but they don't necessarily communicate with the entire network of fans. Furthermore, Burgess & Matamoros-Fernandez (2016) also identified that there are sub-communities in the fandoms on SNS, where each of them will have different norms and ways

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of conversation this either could also explain why this network could have multiple components which are only weakly connected.

Diameter and Spread of Information

The degree of the network was centralization: diameter of the network was 11, that is, information had to pass 11 actors to cover the extreme nodes of the network. This relatively high diameter, along with the low density stated that information transfer was slow within the network as the actors did not have direct linkages between them. Nevertheless, this did not seem to slow down the flow of information as the users were still receiving updates from indirect connections.

Table 4. Diameter Measurement

Metric	Value	Interpretation
Diameter	11	Slow spread of information due to the low density of connections

Figure 2. Word Cloud Visualization of #IkatanCintaEp1012

Source: Netlytic processed by Researchers 2023

The following is the word cloud of the most used words, in the context of, #IkatanCintaEp1012. The largest words correspond with the most frequently used words in the corpus and those are actors' names as well as references to particular scenes or episodes of the soap opera.

Effects of an Actor and His/Her Participation Trends

The Eigenvector Centrality of the network pointed out important actors who are more influential within the hashtag. The number one actors were @andhinikharisma_, @purplove_, @inibeneranuna, @vi_eviee. These users were tied to the middle of the network where most of the traffic of the communication used to happen. However, several actors in this sparse network were able to exert considerable control over the flow of information in this context as a number of their own posts were often retweeted and attracting comments.

Table 5. Actor Centrality

Actor Username	Eigenvector Centrality	Dominance in Network
@andhinikharisma_	100	High
@purplove_	85	Moderate
@inibeneranuna	75	Moderate
@vi_eviee	70	Moderate

These central actors entrusted themselves into the thought-making process and were quite instrumental towards the creation of discourse regarding Ikatan Cinta. They also stated that their was more probable that the tweets of the participants would be retweeted and referred to within the community.

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Thus, the findings of this study can provide insights concerning the 3D fan engagement in digital contexts not only in Indonesia but also in other contexts. In the Ikatan Cinta fan community as represented by the #IkatanCintaEp1012, this study found out how fan communities use Twitter in maintaining conversation about television contents. Jenkins elaborated in Jenkins 2013, that fans turn to social media platforms to continue interacting with media texts a notion that is in agreement with this study. The nature of the network and the extent of activism of multiple performers lead to the conclusion that fan communities, Twitter involve mixed member engagement and passive spectator status.

Furthermore, it extends from the study of Papacharissi (2015) wherein the author discusses the role of affectivity in online communication which is supported in this paper to demonstrate that hashtag mobilization consists not just of the mere utilisation of information sharing tools but of how they foster communities as well. Hashtags also help supporters to feel members of a given community even although they may not be as active in engaging the. This supports Fiske's (1992) proposition that via the social media platform, one can essentially participate in shows and other items of interest through Hashtags among other pertinent tools.

Additional Findings: Communication Clusters

The further analysis of the network showed that it contains the components with weak connections and other with strong connections: weak = 25; strong = 428. This demonstrated that even though a significant number of actors engaged in the network few where part of the densely connected cliques. The majority had weak bonds between them and the rest and each very limited interactions with the other users.

Table 6. Network Structure

Metric	Value	Interpretation
Weakly Connected Components	25	Many loosely connected groups
Strongly Connected Components	428	A higher number of strongly connected user groups

The break up of the network into the weak and strong components showed that there random interactions among fans of Ikatan Cinta. Some of the users engaged in conversations infrequently while there were some who engaged in conversations frequently and continuously.

Modularity indicates that the value equally low, but the closer diameter is 4, meaning that the spread of information is faster. Density shows that, the value is 0.007, because it is far from the value of 1, it means that the value is low mean Communication interaction is low between actors. The actors who emerged from the two are: @andhinikharisma_ account, @purplove_, @inibeneranuna, @vi_eviee as its dominant actors.

In practice, these phases occur in the rise of trending hashtags on Twitter, in the problematization phase, problem identification is carried out by actors who raise issues by uploading photos, videos or tweets equipped with hashtags that have been intended to raise the issue followed by the Integration phase. This phase occurs in the process of inviting and making other actors interested in issues that have been set since the beginning, after that, entering the enrollment phase, namely public acceptance of things that have interests by using twitter as a medium of information and communication technology, finally mobilization, which is the sustainability of the accumulated impact of Twitter hashtag trending with certain issues.

Having a focus on the form of technology practice in everyday practical life ranging from media studies, culture, politics, and other relevant studies so that it can attract technology issues as a constructive discussion. When an actor enters into a new connection, in principle, it changes to 'The actor is a consequent effect'.

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Limitations and Future Research

However, it is pertinent that the limitation of this study be taken into consideration and brought to light before proceeding to the conclusion of this research study. First, it limited the analysis to just Twitter which may not afford the whole picture of the fans interaction especially on other social media platforms that maybe entirely different with different modality at play such as Instagram, YouTube among others. Also, the study relied on archival public Twitter data and as such, missed out on interactions that take place via private messaging or from protected accounts that may help better explain the behavior of fans.

Future research could extend this research by utilizing data from many of the platforms to have a broader understanding of fans' programs' engagement. Furthermore, by adopting explanatory types of research, like interviews with the fans or analysing the tweets, it would be possibly to gain further understanding of the motives and attitude of the definite individual users (Van Dijck, 2013 Last but not the least, for the future research, more attention should be paid to how shifting algorithms, as it was the case with Twitter over the recent years, might affect the formation and development of the fan communities.

Conclusion

In contrast to the one-way flow of information in traditional media like newspapers and television broadcasts, social media platforms inherently exhibit multimodality and prioritize the user. This dynamic blur the distinction between information producers and consumers, leading to a decentralized approach to generating and sharing discourse. Through an examination of Twitter's communication dynamics and the interplay of material entities, Twitter plays a role in shaping leadership as a non-human actor. Twitter actively contributes to leadership by influencing the content and form of communication that emerges as dialogue and written text. The urgency of the existence of actors in trending #IkatanCintaEps1012 is so great but all these things can be analyzed through SNA, through Netlytic and Gephi, resulting that the flow of information is always the speed of information flow depending on the density and diameter formed, because the actors in it, based on existing analysis, without following the central actor, but consisting of various dominant actors with various interactions, even though they do not know each other, fans of the soap opera Ikatan Cinta have the same passion and the same goal to support their favorite soap opera. One of these hashtags is used to identify yourself as a fan of the soap opera.

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