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Impact of social media on JNU Azadi movement: A network analysis of student movement in India

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Abstract
JNU Azadi Movement is a movement which started after the Students' Union President (Jawaharlal Nehru University) Kanhaiya Kumar was allegedly arrested with his colleagues on charges of sedition for conducting a protest on the campus against the capital punishment of Afzal Guru and Maqbool Bhat and aftermath allegations like Anti-National, Sedition and Azadi. The Movement got mass support from across the world through Facebook page "Stand with JNU" and other co-pages, YouTube channels and videos and Twitter accounts. The Movement demanded the release of allegedly arrested students and arrest the culprits. Social Media helped the movement to get success by quick transformation of information and create solidarities under unique Taglines. The paper aimed to find out the network analysis of impact of social media on JNU Azadi Movement. Data has been collected and analyzed using Node XL software package.

Keywords: social media, network analysis, node XL, Azadi, anti-national, sedition

Introduction

Social media is an attentive piece of the new age society. The best way to define social media is to separate it from newspapers and the audio-visual medium of television or radio. It is a group of online communication channels devoted to information, connection, substance, and coordinated effort. Sites and applications committed to discussions, micro-blogging, social system administration, social bookmarking, social 'curation' and wikis are among the distinctive social media. Social media has been advancing rapidly, offering new and significant approaches to individuals around the globe. Presently, social media is developing into an indispensable part of our daily lives.

Social media indicates collaboration among individuals where they edify, make or trade data and plans as virtual groups. Andreas Kaplan and Michael Haenlein describe social media as "a crowd of web-built apps that create an ideology based on the foundation of mechanics of Web 2.0, and allowing the formation and trade in client created substance." In addition, social media relies on versatile and online advances to make exceedingly intelligent stages by which people and groups can offer, talk about, and modify substance produced by the followers. There are various contrasts between social media from conventional/modern media, including quality, achievement, recurrence, ease of use, immediacy, and enduringness.

Social media is the utilization of online and versatile innovations to transform correspondence into intuitive dialogue." (Benkler, Yochai (2006): The Wealth of Networks). "Social media has three signs: First, Evolution, Second, Revolution and then Contribution. In the first place, it is an advancement of how we impart, supplanting email as a rule. It's an upheaval: For the first we have free entry, momentary, worldwide correspondence. We are living in an energizing time. And third, social media is recognized because of the capacity of everyone to impart and help as a distributer." (Mark W. Schaefer – Schaefer Marketing Solutions. Creator of the Tao of Twitter).

Social movements and digital activism

Social movements are complex, loose, and fluid actors made up of networks of informal interactions among diverse participants. While online tools help them to organize in a decentralized way, they do not guarantee stability and continuity. Instead, they favor inclusive activist networks that evolve organically and easily shift their focus according to emerging opportunities.

The Internet can practically support such networks with its capacity for information seeking and dissemination, for mobilization, coordination and the building of a common identity. However, these capabilities are not inherent to online tools but depend on the skills, attitudes, and culture of the activists employing them. Despite the absence of a formal and institutionalized structure, social movements can still engage in certain practices that allow them to endure through time. Regular face-to-face gatherings, collaboration around short-term practical objectives, open narratives, and the maintenance of a permanent space online provide activist networks with more stability and continuity. The Internet provides a communication infrastructure that can turn widespread dissatisfaction into a social movement. Even in movements organizing predominantly online, activists interact through a wide range of media and modes of communication. The ways in which social movements balance and coordinate their presence in these various communication spaces is central to their success and survival.

There are numerous questions to be debated and researched when it comes to the phenomenon of social movements and

what role social media is playing in aiding them in their successes or contributing to their failures. When a social movement is narrowed down into its specifics, however, contextual characteristics become important, such as geographical location and political stabilization. A social movement that takes place in India is going to have different parameters and ramifications than a social movement that takes place in Pakistan. The way in which authoritarian ruling governments control traditional media has certainly promoted the use of social media platforms, as citizens who wish to put out their own opinions can take to social media platforms to combat political views or framed news stories at the behest of the government, but, one can equally look at the governments of Syria, Iran, or Libya to get an understanding of how an authoritarian regime can also use information provided on social media platforms in disastrous and inhumane manners (Morozov 2009: 11).

Representing complex and enduring forms of collective action, social movements have a complicated relationship with digital technologies. They involve participants with disparate attitudes towards technology whose online practices evolve over time. They also employ online tools for a variety of purposes, including mobilization, coordination, and community building. Thus, focusing on social movements can provide a wider and more comprehensive view of the role of the Internet in collective action.

JNU Azadi Movement

On 9th February 2016, Jawaharlal Nehru university- (one of India's foremost public universities) - Students, Union (JNUSU) president, Kanhaiya Kumar, was arrested under section 124A of the Indian penal code on charges of sedition and similar charges were imposed on the other JNU students for their organization of, and participation in, an evening poetry, speeches, talks and song on campus on February 9 2016 related to the execution of Afzal Guru and Maqbool Bhat. The event, for which permission was withdrawn at the last minute, became contentious due to allegation- as yet unattributed to the specific students concerned – of controversial slogans blowing Bharath Matha Key Jai, Pakistan Zindabad and India Murdabad etc. that were raised at the meeting. The quick and inflammatory role of the television and social media, significantly mendacious political interventions on the name of wright wing political ideology stir the issue. Further it went on Anti-National, Azadi and Sedition.

There was a mass support to the JNU Azadi Movement from across the world. It got through social media especially from face book page "Stand with JNU" and other co-pages, YouTube videos and Twitter accounts. It demanded the release of allegedly arrested students and arrests the culprits. By this mass solidarity main demand of the movement has been accepted by getting bail to Kanaiya Kumar on 2nd March. Even though discussions and talks went on the campus till 26 march formally. Since Social Media usage in this Movement is widely spread present study tries to examine the network analysis of the impact of Social Media on JNU Azadi Movement.

Materials and Methods

JNU Azadi Movement has influenced across the world with the help of Social Media by spreading the updates of events. This paper examined the quantitative analysis of effects of Social Media on JNU Azadi Movement. It was easy to get the data of twitter with the help of NodeXL Software but Facebook and YouTube data was not fully available due to restriction from the concerning authority to provide the data. That's why network data analysis has done only for the twitter data.

For the analysis, after collecting all the Twitter data, in order to get a clear picture about the distribution of the messages, data sets have been grouped into clusters. NodeXL provides three of the clustering algorithms from the Stanford Network Analysis Platform (SNAP) library for calculating network metrics from graphs (Marc Smith, 2011), which are the Wakita-and-Tsurumi algorithm, the Girvan-Newman algorithm, and Clauset-Newman-Moore algorithm. These algorithms all try to place densely connected vertices into different groups. Although the Clauset-Newman-Moore algorithm is the first to be proposed to find community structure in social networks, it is limited to the number of nodes within the network and it would take a long time to move forward with the analysis. The Girvan-Newman algorithm focuses more on edges that are most likely between different communities instead of trying to create a measure that tells which edges are the most central within communities. In short, it pays more attention on "between-ness" rather than "centrality." The Wakita-and-Tsurumi algorithm improved Clauset-Newman-Moore algorithm's problem by trying to balance the sizes of the communities being merged and it emphasized "centrality," helping to find vertices with higher diffusion influence (Wakita & Tsurumi, 2007). Therefore, the Wakita-and-Tsurumi algorithm was most appropriate to use in this study's analysis process to produce clearly-separated clusters.

Analysis and Interpretation

Media outlets and general public have supported JNU Azadi Movement under 62 Taglines but researcher has taken five different frames (Taglines): Anti-national, Sedition, Standwith JNU, Stand with kanhaiya Kumar and Azadi. How do these different frames distribute on Twitter? How do individual users respond to different frames on Twitter?

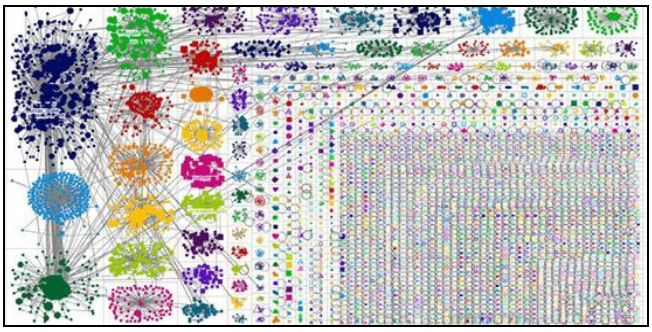

Fig 1: Created with NodeXL (https://nodexl.codeplex.com)

Figure 1. Relationships between Twitter users who tweeted supporting "JNU Azadi Movement" over the period February 9 to March 26, 2016. This graph visualizes the 38,318 different relationships among the 10300 Twitter users who

tweeted supporting "JNU Azadi Movement" over the period February 9 to March 26, 2016. Grey edges represent for "replies-to", "mention", "re-tweet from" relationships. A structure called "Community Clusters" has been observed. A collection of medium sized groups, rather than a crowd of mostly unconnected Twitter users, were formed. The number of unconnected users illustrates the high popularity of this topic because it means many users were expressing their opinions about this topic although they were not influential on the platforms.

From the figure it could be observed that the whole "JNU Azadi Movement" network formed a structure called "Community Clusters". Community Clusters are the defining quality of networks that feature a collection of medium sized groups, rather than a crowd of mostly unconnected Twitter users. Understanding its structure is important for us to identify where the groups are, how they formed, and how many unconnected users there are in the network. More unconnected users mean higher popularity of this topic.

To further examine the diffusion of messages with different key words, sub-groups have been separated out of the whole network to conduct another analysis. All the tweets under different key words were collected during the same period. The most salient keywords related to JNU Azadi Movement are Anti-national followed by Sedition, Stand with JNU, Standwithkanhaiyakumar and Azadi as illustrated in Table 1.

Table 1: Overall Metrics for Social Networks Based on Different Keywords

Metrics	Value				
	Anti-national	**Sedition**	**Stand with JNU**	**Stand with Kanhaiya Kumar**	**Azadi**
Vertices	3,177	998	1,971	882	43
Total Edges	4,952	1,563	3,594	1,378	56
Unique Edges	2,295	771	1,519	687	19
Graph Density	0.00023627	0.000802005	0.000447092	0.00079275	0.012735327
Connected components	1,188	342	719	402	22
Maximum Vertices in a Connected Component	1,158	512	1,758	320	8

To better observe the flow of the message and find opinion leaders, self-loops (any user who is the original publisher, or any user who re-tweet/mention/comment his/her own tweet) have been eliminated and visualized data into the graphs.

Figures 2 through Figure 6. provide the visualizations of tweets collected from February 9 to March 26, 2016 talking about "JNU Azadi Movement" and keywords including "StandwithJNU" (Figure 2), "Standwithkanhaiyakumar" (Figure 3), "Antinational" (Figure 4), "Sedition" (Figure 5), "Azadi" (Figure 6),

Each user who contributed to the Twitter conversation was located in a position in the networks among all participants in the conversation. The bigger the vertex size means the higher in-degree it has. From these figures, it could be clearly figured out that there were student leaders, social activist, academicians and celebrities (opinion leaders) whose tweets had gained lots of responses (re-tweet/comment/mention). It could also be observed from the following figures that within all these networks, although all these five networks had strongly centralized networks, not all the sub-groups were connected together. In the "StandwithJNU" network and the "Standwithkanhaiyakumar" network, there were several isolated groups that were defined as "islands." They were not connected to the rest part of the network, which meant there were several opinion leaders in these two networks whose active followers were a special group of people and these people had such a high loyalty and trust in these opinion leaders that they didn't pay attention to others.

From the visualizations, readers could observe the frame of the "StandwithJNU" as the most discussed one on Twitter, while the frame of the "Azadi" was the least discussed one comparatively.

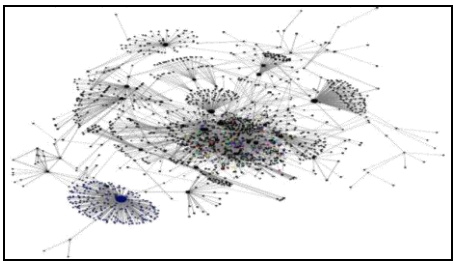

Fig 2: Created with NodeXL (https://nodexl.codeplex.com)

Figure 2 NodeXL visualization of the connections among users who posted tweets including key words, "JNU Azadi Movement" and "StandwithJNU" between February 9 and March 26, 2016. Self-loops have been eliminated during the visualization process. Each user who contributes to the Twitter conversation is located in a position in the networks among all participants in the conversation. Bigger the vertex size is, higher in-degree it has. According to this graph, a quite centralized network could be observed. Opinion leaders whose tweets have gained lots of responses (re-tweet/comment/mention) have been observed.

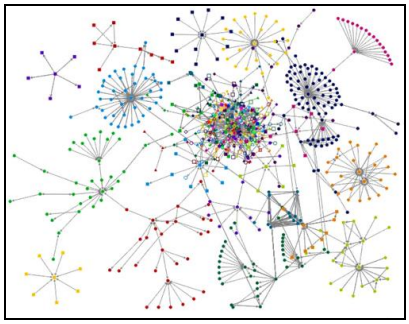

Fig 3: Created with NodeXL (https://nodexl.codeplex.com)

Figure 3. NodeXL visualization of connections among users who posted tweets including key words "JNU Azadi Movement" and "StandwithKanhaiyakumar" between February 9 and March 26, 2016. Self-loops have been eliminated during the visualization process. Each user who contributes to the Twitter conversation is located in a position in the networks among all participants in the conversation. Bigger the vertex size is, higher in-degree it has. According to this graph, although a quite centralized network could be observed, not all the sub-groups are connected together. There are several isolated groups which are defined as "islands". They are not connected to the rest part of the network. It means there are several opinion leaders in this network whose active followers are a special group of people and these people have such a high loyalty and trust in these opinion leaders that they don't pay attention to others.

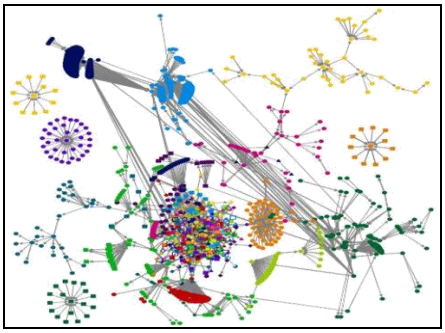

Fig 4: Created with NodeXL (https://nodexl.codeplex.com)

Figure 4 NodeXL visualization of connections among users who posted tweets including key words"JNU Azadi Movement" and "Anti National" between February 9 and March 26, 2016. Self-loops have been eliminated during the visualization process. Each user who contributes to the Twitter conversation is located in a position in the networks among all participants in the conversation. Bigger the vertex size is, higher in-degree it has. According to this graph, although a quite centralized network could be observed, not all the sub-groups are connected together. There are several isolated groups which are defined as "islands". They are not connected to the rest part of the network. It means there are several opinion leaders in this network whose active followers are a special group of people and these people have such a high loyalty and trust in these opinion leaders that they hear them and follow them.

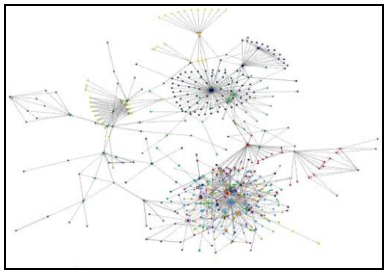

Fig 5: Created with NodeXL (https://nodexl.codeplex.com)

Figure 5 NodeXL visualization of the connections among users who posted tweets including key words "JNU Azadi Movement" and "Sedition" between February 9 and March 26, 2016. Self-loops have been eliminated during the visualization process. Each user who contributes to the Twitter conversation is located in a position in the networks among all participants in the conversation. Bigger the vertex size is, higher in-degree it has. According to this graph, a quite centralized network could be observed. Opinion leaders whose tweets have gained lots of responses (re-tweet/comment/mention) have been observed. However, not like the "Stand with JNU" network, "Standwithkanhaiyakumar" has not been widely used in relevant tweets.

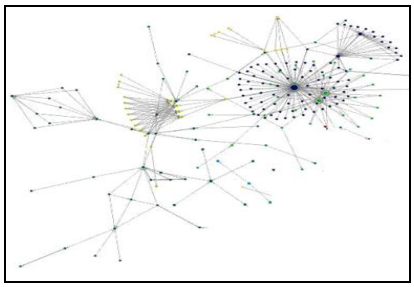

Fig 6: Created with NodeXL (https://nodexl.codeplex.com)

Figure 6 NodeXL visualization of the connections among users who posted tweets including key words "JNU Azadi Movement" and "Azadi" between February 9 and March 26, 2016. Self-loops have been kept during the visualization process because lack of interaction among each user. Each user who contributes to the Twitter conversation is located in a position in the networks among all participants in the conversation. Bigger the vertex size is, higher in-degree it has. According to this graph, a quite loose network could be observed. Only few opinion leader whose tweets have gained lots of responses comparatively (re-tweet/comment/mention) has been observed.

Conclusion

The analyzed datasets and network graphs revealed information at the level of both individuals and groups. In the whole network, including all the tweets talking about "StandwithJNU" during certain period of time, a big amount of self-loops were observed. The high number of self-loops represented the popularity of this topic. Not only did users follow opinion leaders' discussions, but some users also made their opinions about this political issue known independently without being influenced by others.

When it came to the five different message frames, there were several specific findings. The most mentioned key words are "StandwithJNU" and "StandwithKanhaiyakumar." Other words, which were so extremely emotional, including "Sedition," "Antinational," and "Azadi" were comparatively less discussed. Although the "Azadi" network had the least vertices. It had the highest density within the five networks, which meant it had the highest interconnectedness of its vertices. Therefore, it suggested that people who were talking about the "Azadi" frame shared things in common that united them into a well-communicated group. Although the opinion leaders in the "Azadi" network were not as influential as the ones in other networks, there were many interactions among

regular users and that was the effect that made the network interconnected.

In the "StandwithJNU" network, its low density indicated that it had quite a few isolated sub-groups defined as 'islanders.' Because too many people framed JNUAzadiMovement as a "StandwithJNU," the sentiment spread broadly, which made it hard to connect everyone together into a solid group. The "StandwithJNU" network was great for raising awareness of the topic, whereas the "Azadi" network had advantages on creating a loyal group that supported the idea. Generally speaking, no apparent relationship had been found among opinion leaders, however it still differed from frame to frame.

The "Antinational" network was the one in which most opinion leader interactions were found. The "StandwithJNU," "StandwithKanhaiyakumar," and "Antinational" networks had several interactions existing in each network.

The research also showed that if the connection was between two similar opinion leaders, then it did not greatly broaden the network; however, it was great to solidify the relationships and to make the audience persuaded. On the other hand, if the connection was between different kinds of opinion leaders, the target this frame reached was much bigger. From the contrast analysis about between-ness centrality and in-degree, it could be observed that not only vertices with most responses were the most important ones.

There were two kinds of notable users: "hubs" and "bridges" (Smith, Rainie, Shneiderman & Himelboim 2014). In this research, "Hubs" means that vertices have a great amount of interactions with other vertices; in another words, a high in-degree. For example, its tweets have been re-tweeted/commented many times. "Bridges" refer to vertices with a high between-ness centrality. These users have links across sub-group boundaries and have the capability passing information from one group to another. Those successfully diffused frames need both "hubs" and "bridges." Although the "bridges" don't have many connections, they were the ones that could diffuse message from opinion leaders to a broader area, dramatically expanding the influence.

Limitations

There were limitations with this research. First of all, it cannot be ignored that people who take their time posting and interacting on Twitter are a quite special group, especially those who are eager to talk about politics on social media platforms. They may be different from other Twitter users. Therefore, their performance cannot represent all the Twitter users. Moreover, Twitter users are only 18% of Internet users and 14% of the overall adult populations (Smith, Rainie, Shneiderman & Himelboim, 2014), so Twitter users' behavior cannot represent the total Internet users or the total population (Pew Internet 2014).

Second, the tweets collected by *NodeXL* in this research were just snapshots of related tweets in a certain period of time. The data sets did not represent the larger period of discussion beyond the time frame during which the data was collected.

Since this research focused on users' responses on the Twitter platform, in order to further this research, other social media platforms could be studied to see if there is any difference among different social media platforms. Moreover, people's perception was impossible to measure with social network analysis alone. Survey or experimental design could be conducted to understand people's attitudes towards Edward Snowden issue. The results could be compared with Social Network Analysis results. Does users' social media engagement, including re-tweet/comment/mention, really reflect their attitude and perception? What factors influence their decision? Are they exposed to all the different frames? Or is there a filter bubble (Pariser, 2011) caused by users' active social media following preference to block them from other different frames? These potential research questions are valuable to help researcher to gain a deeper and more accurate understanding about how different frames are influencing people's attitudes towards public issues and to figure out a better communication strategy to tackle it.

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