

Social Network Comparison of Netflix, Disney+, and OCN on Twitter Using NodeXL

¹Soochang Lee, ²Keuntae Song*, ³Woojin Bae, ⁴Joohyung Choi

¹Professor of Department of Police Administration, DaeKyeung University, Korea

^{2*}Professor of Department of Broadcasting & technology, DaeKyeung University, Korea

³Professor of Department of Theater and Film, DaeKyeung University, Korea

⁴professor of Department of Art Makeup, DaeKyeung University, Korea

{leesc, ktsong*, baewj, jbsfx}@tk.ac.kr

Abstract

We analyze and compare the structure of the networks of Netflix, Disney+, and OCN, which are forerunners in OTT market, on Twitter. This study employs NodeXL pro as a visualization software package for social network analysis. As a result of the comparison with values of Vertices, Connected Components, Average Geodesic Distance, Average Betweenness Centrality, and Average Closeness Centrality. Netflix has comparative advantages at Vertices, Connected Components, and Average Closeness Centrality, OCN at Average Geodesic Distance, and Disney+ at Average Betweenness Centrality. Netflix has a more appropriate social network for influencer marketing than Disney+ and OCN. Based on the analysis results, the purpose of this study is to explain the structural differences in the social networks of Netflix, Disney+, and OCN in terms of influencer marketing.

Keywords: Social Network, OTT, Netflix, Disney+, OCN, Twitter, NodeXL

1. INTRODUCTION

Twitter, one of the most influential social network services used in many parts of the world, has gained popularity among its users closely for social network building and information sharing. SNSs, including Twitter, Instagram, and Facebook, and the like, have been used widely by users with the expectation of generating social capital, such as obtaining social and emotional support from peer members in online communities [1]. With the dynamic growth of the Untact society due to Covid-19, SNSs have been by far strengthening their roles of communication and information sharing, at times going beyond them with a negative or positive impact on behaviors of the users on social network service.

Users of SNSs such as Twitter promote their connectivity with others based on sharing content that includes personnel or social issues and events, even political disputes in heated debates. Influential users in a site like Twitter are more likely to build a friendly relationship with other users to share information and to maintain users' networks [2]. Social media is a good information source in which some influential users of SNS users try to affect their followers or other users on SNSs for monetary rewards or incentives by sharing their

Manuscript received: January 4, 2022 / revised: March 1, 2022 / accepted: March 8, 2022

Corresponding Author: ktsong@tk.ac.kr

Tel: +82-53-850-1406, Fax: +82-53-850-1450

Professor, Dept. of Broadcasting & Technology, Daekyeung University, Korea

Copyright©2022 by The International Promotion Agency of Culture Technology. This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0>)

information, knowledge, and personal experiences with others.

There are three types of information-sharing behaviors, such as collaborative/collective behaviors, mutual-benefit behaviors, and relationship-based behaviors [3]. In social network sites, people may share information with an intention to collaborate with others to achieve common goals, to pursue benefits of learning or obtaining knowledge, and to build relationships with one another [4]. That advantages help to make influential users, so-called influencers, having over a million followers. That's why more brands should become interested in partnerships with influencer marketing.

Paid advertising in influencer marketing campaigns is fast becoming a norm in business. It seemed unusual at first because influencer marketing is not supposed to be anything like traditional advertising. However, it has been discovered that amplifying the reach of content created by influencers through paid advertising pushes out the content to more people interested. Business marketing strategies linking up with SNS influencers are becoming popular in the media market.

Since Netflix penetrated the Korean media market in 2016, the OTT (Over-the-Top) market in Korea has grown at an astonishing speed. Recently, Disney+ jumped into the OTT market in the Korean media market, causing a three-way race among Netflix, OCN, and Disney+. The OTT market is on an Internet streaming service platform with easy access to SNS. The accessibility lets the OTT market give its mind to a marketing strategy utilizing SNS. OTT is building a network with influential users on SNS to attract subscribers by developing exclusive content.

Marketing strategies using SNS in the OTT market are expected to be intensive, and brands such as Netflix, Disney+, and OCN will have to spend more money to find influences with powerful-social networks on SNS to sell their content well. This study examines how users organize and keep their networks on Twitter, identifying each role of influential users and others to build the network. It is also to analyze the structure of the networks of the three brands, Netflix, Disney+, and OCN, overwhelming the OTT market in Korea. From the analytical results, the study can discriminate the differences between the networks of the three brands, explaining the interaction between users posting tweets.

2. RESEARCH METHOD

The purpose of the study is to analyze and compare the structures of Twitter networks related to the overwhelming three bands in the Korean OTT market. One of the few social media platforms to provide near-complete public access to its data is Twitter, and it can be argued that the infrastructure of Twitter is so unique that most Twitter accounts are public [5]. Furthermore, due to the ability to use the hashtag on the platform, anyone can contribute to making Twitter an ideal platform for emerging news stories [6].

With understanding Twitter, we must introduce social network analysis as a methodology for analyzing the networks of Twitter. Social network analysis comes from network theory and the use of graphs as representations of symmetric and asymmetric relations among what can be regarded as discrete objects. The key distinctive feature of social network analysis is to identify relationships between SNS users, rather than their characteristics [7]. Social network analysis is a unique methodology with its version of data collection, statistical analysis, and presentation of the results. Its most important tenet is that it enables researchers, practitioners, and educators to see how actors are located or embedded in the overall network [8]. This way of thinking creates an advantage of multilevel analysis. Its methodology enables the analysis of relationships between individuals, groups, teams, cliques, agencies, and organizations. Thus, a network analyst would be concerned with how an actor is in the network and how that very structure is created by the relationships among those actors [9].

This study employs NodeXL pro as a visualization software package for social network analysis. With a literature review, it was found that there are a wide range of disciplines that have utilized NodeXL for the analysis of research data. NodeXL was most recently mentioned in articles published in a variety of journals for its ability to analyze social media data [5]. These articles noted that NodeXL reports were able to display popular content and provide insight into popular webpages that were cited in tweets [6].

3. ANALYZING SOCIAL NETWORKS OF THREE BRANDS

The study collected data from Twitter and analyzed the social networks of the three brands one by one. This study calculated the values of overall graph metrics and overall centrality to compare the networks of the three brands, mapping each social network for visualization of the network structure.

3.1 Analysis of Social Network of Netflix

Table 1 shows overall statistical values on the social network of Netflix on Twitter. The number of Vertices is 1,975, and the number of the Unique Edges is 1,925, but there are 511 Edges With Duplicates, so the total links are 2,440, which means that there are many Twitter accounts in the social network of Netflix with close relationships by sharing information. The number of Connected Components (596) is more than Single-Vertex Connected Components (277), which means that nodes with more than two communicators have close information-exchanging relationships among each other, but some independent communicators have a relationship with just one communicator. The Average Geodesic Distance is 3.955786, which means that two random nodes can be linked through about 4 links.

Table 1. Overall Graph Metrics of Netflix

Index	Value	Index	Value
Vertices	1,975	Single-Vertex Connected Components	277
Unique Edges	1,925	Maximum Vertices in a Connected Component	295
Edges With Duplicates	511	Maximum Edges in a Connected Component	681
Total Edges	2,440	Maximum Geodesic Distance (Diameter)	11
Self-Loops	484	Average Geodesic Distance	3.955786
Connected Components	596	Graph Density	0.000445026

As we can see from Table 2, In-Degree and Out-Degree are 1.041 on average, Average Betweenness Centrality (ABC) is 278.381, representing that a node takes about 278 steps to get the information through a mediator without a direct linkage on average. The value of Average Closeness Centrality (ACC) is 0.266, which means that a node has an Average Connection Distance of 0.226 ($0 < ACC < 1$) with other nodes with strengthened domination of information.

Table 2. Overall Centrality of Netflix

Index	Value	Index	Value
Average In-Degree	1.041	Average Betweenness Centrality	278.381
Average Out-Degree	1.041	Average Closeness Centrality	0.266

Figure 1 shows the network structure of Netflix on Twitter. The social network of Netflix shows that all 1,975 nodes are connected, but some nodes are widespread from the center. Most of the nodes are in the center

of the whole network with a relatively low Average Closeness Centrality, Netflix's network can quickly spread information or resources into the network. Connected Components, which means the number of links connected in the network, have a complex connection structure with 596.

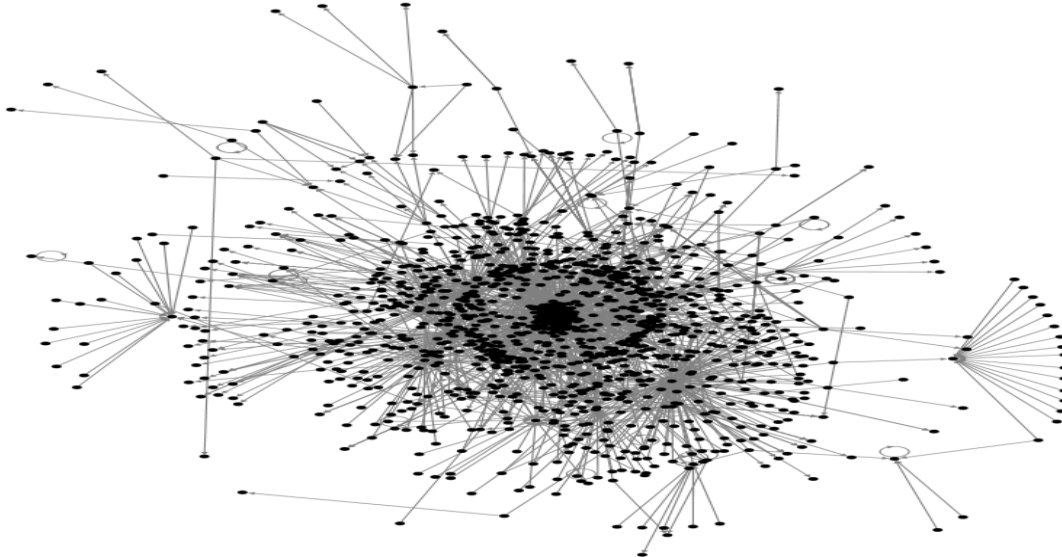


Figure 1. Mapping Social Network of Netflix on Twitter

3.2 Analysis of Social Network of Disney+

Table 2 shows overall statistical values on the social network of Disney+ on Twitter. The number of Vertices is 1,896, and the number of the Unique Edges is 1,818, but there are 206 Edges With Duplicates, so the total links are 2,024. The number of Connected Components (325) is more than Single-Vertex Connected Components (233). The Average Geodesic Distance is 3.754042, with two random nodes linked through about less than 4 links.

Table 3. Overall Graph Metrics of Disney+

Index	Value	Index	Value
Vertices	1,896	Single-Vertex Connected Components	233
Unique Edges	1,818	Maximum Vertices in a Connected Component	1,395
Edges With Duplicates	206	Maximum Edges in a Connected Component	1,565
Total Edges	2,024	Maximum Geodesic Distance (Diameter)	10
Self-Loops	305	Average Geodesic Distance	3.754042
Connected Components	325	Graph Density	0.000453113

According to Table 2, In-Degree and Out-Degree are 1.002 on average, Average Betweenness Centrality (ABC) is 2,830.273, representing that a node takes about 2,830 steps to get the information through a mediator without a direct linkage on average. The value of Average Closeness Centrality (ACC) is 0.083, which means that a node has an Average Connection Distance of 0.083 ($0 < ACC < 1$) with other nodes with strengthened domination of information.

Table 4. Overall Centrality of Disney+

Index	Value	Index	Value
Average In-Degree	1.002	Average Betweenness Centrality	2,830.237
Average Out-Degree	1.002	Average Closeness Centrality	0.083

Figure 2 shows the network structure of Disney+ on Twitter. The social network of Disney+ shows that all 1,896 nodes are connected, but some nodes are widespread from the center. Most of the nodes are in the center of the whole network with a relatively low Average Closeness Centrality, Disney+ network can quickly spread information or resources into the network. Connected Components are 325 with three gigantic-influential clusters mediated by some nodes. They have high betweenness centrality on Disney+ network and can distort information or threaten the network by obstruction of relational activities on the path of related links.

**Figure 2. Mapping Social Network of Disney+ on Twitter**

3.3 Analysis of Social Network of OCN

Table 3 shows overall statistical values on the social network of OCN on Twitter. The number of Vertices is 1,560, and the number of the Unique Edges is 1,921, but there are 86 Edges With Duplicates, so the total links are 2,007. The number of Connected Components (26) is more than Single-Vertex Connected Components (12). The Average Geodesic Distance is 2.514088, with two random nodes linked through about 2.5 links.

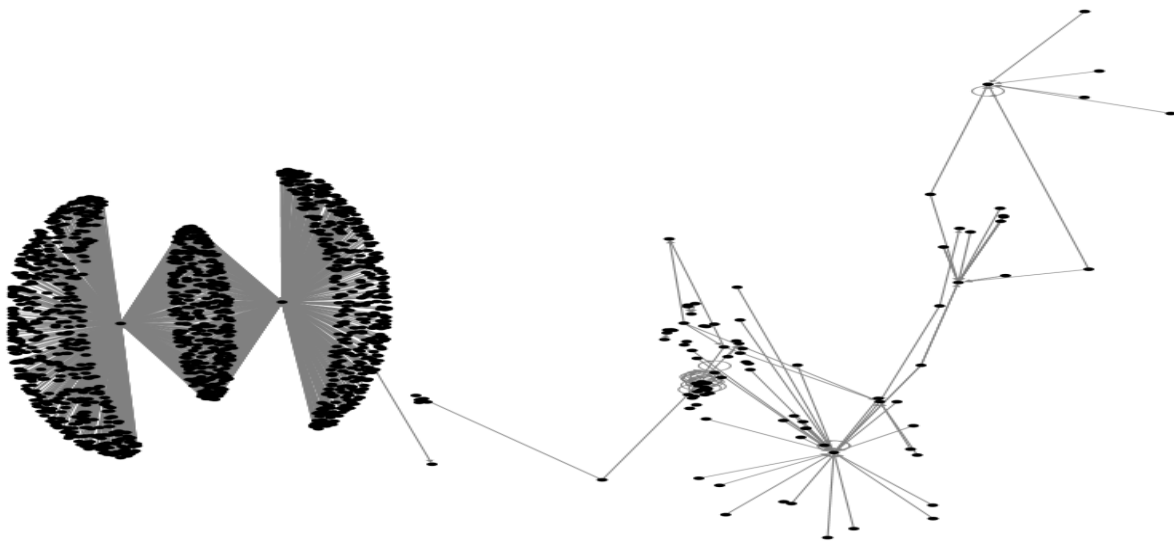
Table 5. Overall Graph Metrics of OCN

Index	Value	Index	Value
Vertices	1,560	Single-Vertex Connected Components	12
Unique Edges	1,921	Maximum Vertices in a Connected Component	1,458
Edges With Duplicates	86	Maximum Edges in a Connected Component	1,894
Total Edges	2,007	Maximum Geodesic Distance (Diameter)	6
Self-Loops	26	Average Geodesic Distance	2.514088
Connected Components	26	Graph Density	0.000798095

Table 6. Overall Centrality of OCN

Index	Value	Index	Value
Average In-Degree	1.255	Average Betweenness Centrality	2,066.176
Average Out-Degree	1.255	Average Closeness Centrality	0.012

Figure 3 shows the network structure of OCN on Twitter. The social network of OCN shows that all 1,560 nodes are connected, most of nodes are connected to three link clusters. The OCN network is formed of three huge link clusters and one component with a loosely related and independent link from the clusters. The three-link clusters are connected through two mediators with high betweenness centrality, with the mediators affecting the flow of information and controlling the structure of the OCN network.

**Figure 3. Mapping Social Network of OCN on Twitter**

As shown from table 7, the social networks of Netflix, Disney+, and OCN are compared based on values of Vertices, Connected Components, Average Geodesic Distance, Average Betweenness Centrality, and Average Closeness Centrality. Netflix has comparative advantages at Vertices, Connected Components, and Average Closeness Centrality, OCN at Average Geodesic Distance, and Disney+ at Average Betweenness Centrality.

Table 7. Comparison of Networks of Netflix, Disney+, and OCN

Index	Netflix	Disney+	OCN	Comparative Advantage
Vertices	1,975	1,896	1,560	Netflix > Disney+ > OCN
Connected Components	596	325	26	Netflix > Disney+ > OCN
Average Geodesic Distance	3.955786	3.754042	2.514088	OCN > Disney+ > Netflix
Average Betweenness Centrality	278.381	2,830.273	2,066.176	Disney+ > OCN > Netflix
Average Closeness Centrality	0.266	0.083	0.012	Netflix > Disney+ > OCN

4. CONCLUSION

This study analyzes and compares the structure of the networks of Netflix, Disney+, and OCN on Twitter. This study employs NodeXL pro as a visualization software package for social network analysis. From the

comparison with values of Vertices, Connected Components, Average Geodesic Distance, Average Betweenness Centrality, and Average Closeness Centrality, it shows that Netflix has comparative advantages at Vertices, Connected Components, and Average Closeness Centrality, OCN at Average Geodesic Distance, and Disney+ at Average Betweenness Centrality.

Compared to the networks of Disney+ and OCN, Netflix has a well-organized network for sharing information. Since Netflix has a high degree centrality and closeness centrality, the dependence between nodes is relatively low which means that influential nodes can have a stronger impact on the network. In addition, Netflix is more effective in spreading information across the entire network than Disney+ and OCN as nodes are getting closer to the center of the network. In the case of influencer marketing, Netflix has a much more efficient social network on Twitter than Disney+ and OCN. Netflix can take a comparative advantage in enhancing public awareness by exposing its content to more public.

Disney+ has a densely social network on Twitter regardless of the short entrance history of Disney+ into the OTT market. Since all nodes are divided into at least three or up to four clusters, the centrality is not well-formed. It is expected that Disney+ is likely to get a dense centrality if it performs the start of influencer marketing. With a long history in the OTT market, OCN has a network with three-node clusters like a gear wheel. It seems as if the three have good connectivity, but they are in a mutually exclusive relationship if no mediators. It has a network structure in which it is difficult for users outside the network to access the OCN network, with limited information exchange taking place. OCN does not have a social network on Twitter for influencer marketing.

Influencer marketing is a type of social media marketing using endorsements and product mentions from influencers—individuals who have a dedicated social following and are viewed as experts within their niche. The most important thing of the successful conditions for influencer marketing is that there should be a densely well-organized social network on SNS. For the growth-oriented future of the OTT market, brands must mobilize the high amount of trust that influencers have built up with their following on SNS.

REFERENCES

- [1] A. N., Joinson, 'Looking at', 'Looking up' or 'Keeping up with' People?: Motives and Uses of Facebook. In: Proceedings of the 26th International Conference on Human Factors in Computing Systems (CHI2008), Florence, Italy, pp. 1027-1036, April 5-10, 2008.
- [2] E, Tonkin, H. D., Pfeiffer and G, Tourte, Twitter, Information Sharing and the London Riots? Journal of the American Society for Information Science and Technology, Vol. 38, No. 2, pp. 49-57, 2012. doi: 10.1002/bult.2012.1720380212
- [3] X, Bao and F, Bouthillier, Information Sharing: As a Type of Information Behaviour. In: Proceedings of the 35th Annual Conference of the Canadian Association for Information Science, Montreal, pp. 1-14, May 10-12, 2007.
- [4] S, Sue Yeon and O, Sanghee, Why Do Social Network Site Users Share Information on Facebook and Twitter? Journal of Information Science, Vol. 41, No. 5, pp. 553-569, 2015. doi: 10.1177/01655515155585717
- [5] G. Mackenzie, Twitter Big Data and Infectious Disease Conferences, The Lancet Infectious Diseases, pp. 146-154, February 2018. doi: 10.1016/S1473-3099(18)30011-2
- [6] W. Ahmed and L. Sergej, Social Media Analytics: Analysis and Visualization of News Diffusion Using NodeXL, Online Information Review, Vol. 43, No. 4, pp. 1-19, 2018. doi: 10.1108/OIR-03-2018-0093
- [7] R. Drew and P. Aggleton, "Using Social Network Analysis to Evaluate a Complex Policy Network,"

Evaluation, Vol. 17, No. 4, pp. 383-394, 2011. doi.org/10.1177/1356389011421699

- [8] R. A., Hanneman, Introduction to Social Network Methods. Riverside: University of California Riverside, 2001.
- [9] K. G., Provan, A. Veazie, L. K., Staten, & N. I., Teufel-Shone, The Use of Network Analysis to Strengthen Community Partnerships, Public Administration Review, Vol. 65, No. 5, pp. 603-613, 2015. doi: 10.1111/j.1540-6210.2005.00487.x