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Decomposing Twitter Network in Tourism Marketing

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Abstract

This study is to analyze the structure of the networks of tourism marketing on Twitter, identifying the most prominent users, the flow of information about tourism marketing, and the interaction between the users posting tweets. This study employs NodeXL pro as a visualization software package for social network analysis. The number of vertices or nodes is 171, and the number of the unique edges or links is 128, but there are 101 edges with duplicates, so the total links are 229, which means that there are fewer Twitter accounts in the social network on tourism marketing, but they have a few close relationships by sharing information. The research can map the social network of communicators of tourism marketing using Twitter data. The network has a complicated pattern, including one independent network and some connected networks. Some mediators connect each network and can control the information flow of tourism marketing. More communicators are getting the information than the ones providing it, which means that there is likely to be the dependence of information among communicators that can cause an obstacle and distortion of the information flow system, especially in the independent network.

Keywords: Tourism Marketing, Social Network Service, Twitter, NodeXL

1. INTRODUCTION

Tourism is a multifaceted phenomenon, which needs multidisciplinary research-focuses including the disciplines of recreation, economics, anthropology, and geography. Tourism is a multifaceted phenomenon, which needs multidisciplinary research interests such as recreation, economics, anthropology, and geography. Based on these disciplines, classical tourism has temporal, spatial, and content limitations in utilizing tourism resources and builds the methodological and conceptual foundations of tourism studies. Given that tourism has a multidisciplinary character, in particular, the literature refers to that tourism has a relationship with business administration and management. Tourism is a kind of industry, which means that the tourism industry has to utilize marketing as a core strategic tool to boost profitability. It should get more integrated communication in publicity and marketing than targets for general corporate or product brand awareness management.

Among a host of business perspectives dealing with tourism-related topics, marketing is probably the most active. In a review of recent tourism journal publications, tourism marketing is by far the most popular topic [1]. As market orientation has been a core philosophy underpinning corporate marketing management since the middle of the last century, the tourism industry has also placed a strategic emphasis on marketing orientation for tourism resources and programs.

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for tourism resources and programs. Tourism researchers have long noted that several industry-specific and product-related characteristics contribute to the uniqueness of tourism marketing processes. These characteristics include customers' shorter exposure to services, more emotional buying appeals, greater importance on managing evidence, greater emphases on stature and imagery, more variety and types of distribution channels, more dependence on complementary organizations, easier copying of services, and more emphasis on off-peak promotion [2], which make tourism and hospitality marketing special. Besides, as the tourism industry is an industry that accompanies clients' emotions, it is important to stimulate their emotions. Building relationships with customers is of vital importance part in the tourism industry [3]. The tourism industry needs strategic marketing to promote the vitalization of the industry by visualizing the characteristics.

The development of information and communication technology has been bringing innovations to the world of marketing. Social network services such as Facebook, Instagram, and Twitter are very effective tools for advertising services and products. In social network services, popular influencers in social network services have many followers and impact them. They can play an important role as an excellent advertising medium for businesses because they affect indirectly or directly their followers and people visiting their websites. Given that social network services are effective and efficient marketing strategies, analyzing the network structure between influencers and followers and identifying the relationship between them can contribute to making the marketing strategy successful.

Twitter is one of the top ten most visited websites, the most popular microblogging site in the world. The value of Twitter data and metadata for the interpretation of users' communication and behavior is being used in academic and business societies. Twitter has become one of the most important information channels about current personal and public events. [4]. Prevalence of Twitter generates significant implications for hospitality and tourism [5], with Twitter taking one of the top three platforms for information on tourism marketing. Tourism is one of the industries that have gained vast benefits from social networks, specifically in tourist behavior observing, planning, and developing marketing strategies. Numerous studies examined the impact of social networks and e-WoM on tourism [6]. However, most of the research focused on Facebook, e.g., as an example of a social network used in a destination or for tourism planning [7].

This study would focus on the utilization of Twitter in tourism marketing. The main goal of the research is to analyze the structure of the networks of tourism marketing on Twitter, identifying the most prominent users, the flow of information about tourism marketing, and the interaction between the users posting tweets.

2. RESEARCH METHOD

The purpose of the study is to analyze the Twitter network on tourism marketing. It mainly focuses on the structure of Twitter users' networks and the information flow of tourism marketing. Evaluators have explored the methods known as social network analysis to understand the network structure and their roles in social communications [8]. The method uses various tools – network diagrams, network matrices, and mathematical measures – to depict and aid understanding of social networks [9]. 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 the focus on relationships between actors, rather than their characteristics [10].

The two most common sociometric properties of networks are network density and network centrality. Social scientists have long contended that networks with higher densities, specifically greater interconnectivity among group members, are more homogenous in terms of the network members' behavior. Density is typically calculated as a proportion with a value ranging from 0 to 1, which shows the actual number of direct ties as a function of the possible number of ties within a network of a given size. Centrality assesses the prominence of certain members in a network, including degree centrality, betweenness, and Bonacich centrality [11]. Degree centrality is a measure of the number of ties within a network to a particular node, or the number of edges adjacent to a node [8]. As a measure of centrality, betweenness is a count of the number of pairs of nodes between which a given node lies. This measure of centrality assesses how effectively one node bridges the gaps between other nodes [12]. These density and centrality explain the features of the network of communicators sharing tourism information.

This study employs NodeXL pro as a visualization software package for social network analysis. This program has access to social media network data importers, advanced network metrics, and automation. Given the purpose and process of the research, NodeXL pro is the most appropriate toolkit for examining the social network of Twitter.

3. ANALYZING SOCIAL NETWORK

The study collected data from Twitter to analyze the network characteristics in advertising and marketing tourism in Korea. Table 1 shows overall statistical values on the social network of communication on tourism marketing. The number of vertices or nodes is 171, and the number of the unique edges or links is 128, but there are 101 edges with duplicates, so the total links are 229, which means that there are fewer Twitter accounts in the social network on tourism marketing, but they have a few close relationships by sharing information. The number of connected components (109) is more than single-vertex connected components (99), 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 analytical results represent that the information flow of tourism marketing does not have a good circulation. The average Geodesic Distance is 1.747972, which means that the distance between node and node is very close.

Table 1. Overall Graph Metrics

Index	Value	Index	Value
Vertices	171	Single-Vertex Connected Components	99
Unique Edges	128	Maximum Vertices in a Connected Component	40
Edges With Duplicates	101	Maximum Edges in a Connected Component	40
Total Edges	229	Maximum Geodesic Distance (Diameter)	2
Self-Loops	165	Average Geodesic Distance	1.747972
Connected Components	109	Graph Density	0.002132783

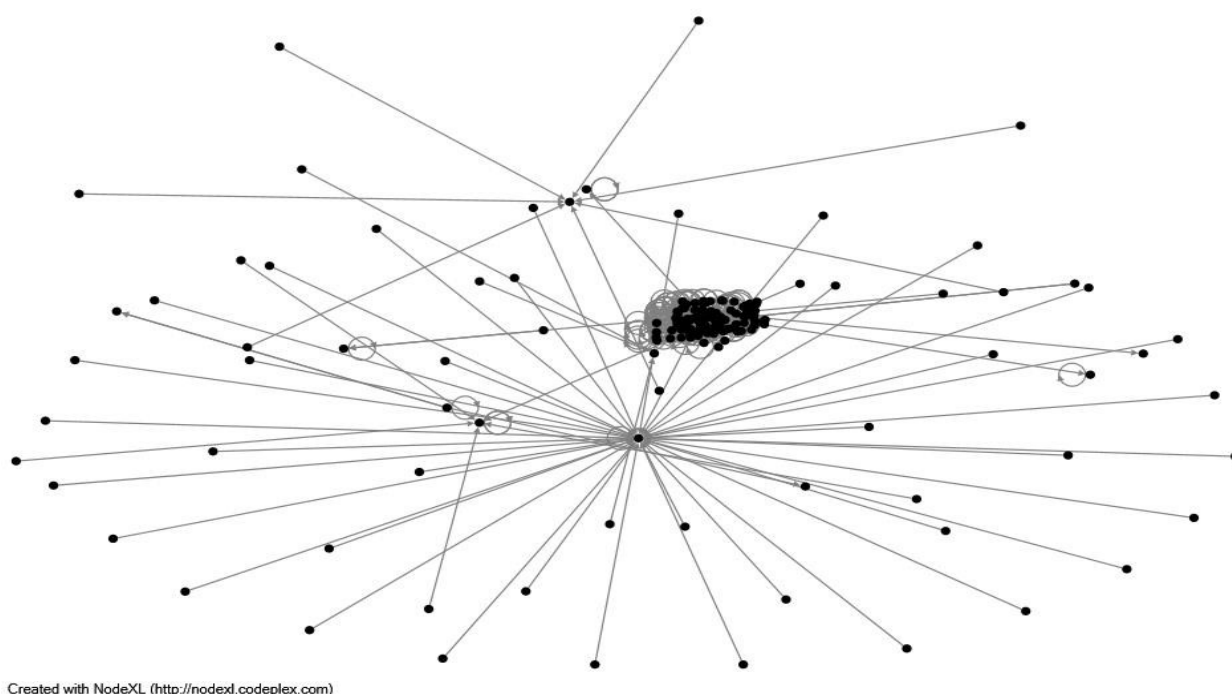
As we can see from Table 2, In-Degree and Out-Degree are 0.931 on average, which means that the leading nodes do not have many networks with other nodes both inside and outside. Table 2 shows that nodes do not have more opportunities to get information on tourism marketing. Average Betweenness Centrality is 20.944, representing that nodes take about two steps to get the tourism information through a mediator without a direct linkage, so mediators can distract or exclude nodes who need the information. The value of Average Closeness Centrality is 0.170, which means that the leading nodes are closed to other nodes with strengthened domination of tourism information.

Table 2. Overall Centrality

Index	Value	Index	Value
Average In-Degree	0.931	Average Betweenness Centrality	20.944
Average Out-Degree	0.931	Average Closeness Centrality	0.170

There are 173 on Twitter, some users of them, influencers like nylee21, mcstkorea, and kor-visitkorea, have millions of followers, playing the most vital role of offering tourism information to communicators on Twitter. Some users like headlinejeju, sundalgangzi, jinfilm, bluange56963929, and king146h with few followers have millions of tweets, sharing tourism information. As can be seen from Figure 1, there are groups of nodes forming a cluster. The cluster shows that nodes do not get a strong connection with each other. Besides, this cluster has a weak network structure with other nodes. On the other hand, there is a network in which many nodes have a strong linkage to one leading node. This network does not have sub-networks but has strong central connectivity.

The research can map the social network of communicators of tourism marketing using Twitter data. The network has a complicated pattern, including one independent network and some connected networks. Some mediators connect each network and can control the information flow of tourism marketing. More communicators are getting the information than the ones providing it, which means that there is likely to be the dependence of information among communicators that can cause an obstacle and distortion of the information flow system, especially in the independent network.



Created with NodeXL (<http://nodexl.codeplex.com>)

Figure 1. Mapping Network of Tourism Marketing on Twitter

Figure 2 shows the social network of communicators of tourism marketing with accounts used on Twitter. In an independent network, bestplace-junho is the leading node, the main influencer, with the controlling power of information flow. bestplace-junho has an information-sharing relationship with 33 nodes. In the network, 33 nodes significantly depend on the leading node with a high possibility of information distortion, so it is important to identify what kind of information and how the main influencer shares with them. The big influencer on Twitter on tourism marketing, bestplace-junho is a big fan of Junho Lee who is a member of 2PM, an idol group in Korea. On the other hand, jinfilm has an influence on some nodes as an information provider with a mediator. In counterpoint to bestplace-junho in the independent network, jinfilm has a good flow of information input and output by linking with the main resources of information, so there is unlikely to be information distortion.

social media pages. The quintessential function of social media pages is not to exchange information but to enhance the image of their tour programs, which highlights that thousands or millions of followers or simple visitors on the social network services are more likely to spread comments and contents posted by the leading influencers. Lastly, given that social network services like Twitter, Facebook, and Instagram have been replaced traditional marketing mechanisms, tourism agencies should make their social media marketing strategy and tactics more effective.

REFERENCES

- [1] L. Xiang & J. Petrick, "Tourism Marketing in an Era of Paradigm Shift," *Journal of Travel Research*, Vol. 46, No. 3, pp. 235-244, 2008. doi: 10.1177/0047287507303976.
- [2] A. Morrison, *Hospitality and Travel Marketing*, 3rd ed., 2002, Delmar Publishers, Inc.
- [3] P. Kotler, J. Bowen, and J. Makens, *Marketing for Hospitality and Tourism* 4th ed., 2006, Upper Saddle River, NJ: Prentice Hall.
- [4] H. Tenkanen, E. Di Minin, V. Heikinheimo, A. Hausmann, M. Herbst, L. Kajala, & T. Toivonen, "Instagram, Flickr, or Twitter: Assessing the Usability of Social Media Data for Visitor Monitoring in Protected Areas," *Scientific Reports*, Vol. 7, No. 1, pp. 1-12, 2017. doi: 10.1038/s41598-017-18007-4.
- [5] W. H., Kim and B. Chae, "Understanding the Relationship among Resources, Social Media Use and Hotel Performance: The Case of Twitter Use by Hotels," *International Journal of Contemporary Hospitality Management*, Vol. 30, No. 9, pp. 2888-2907, 2018.
- [6] X. Y., Leung, B. Bai, & K. A., Stahura, "The Marketing Effectiveness of Social Media in the Hotel Industry: A Comparison of Facebook and Twitter," *Journal of Hospitality & Tourism Research*, Vol. 39, No. 2, pp. 147-169, 2015. doi.org/10.1177/1096348012471381.
- [7] M. Bruhn, V. Schoenmueller, & D. B., Schäfer, "Are Social Media Replacing Traditional Media in Terms of Brand Equity Creation?," *Management Research Review*, Vol. 35, No. 9, PP. 770-790, 2012. doi: org/10.1108/01409171211255948
- [8] <https://www.investopedia.com/terms/p/public-good.asp>.
- [9] M. M, Durland and K. A., Bricks, "Social Network Analysis in Program Evaluation. New Directions in Evaluation," *American Evaluation Association*, Vol. 3, No. 107, pp. 1-101, 2016.
- [10] 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.
- [11] E. Rice and Y-M. Amanda, "Social Network Analysis as a Toolkit for the Science of Social Work," *Journal of the Society for Social Work and Research*, Vol. 6, No. 3, pp. 369-383, 2015. doi.org/10.1086/682723.
- [12] E. Otte & R. Rousseau, "Social Network Analysis: A Powerful Strategy, also for the Information Sciences," *Journal of Information Science*, Vol. 28, No. 6, pp. 441-453, 2002. doi.org/10.1177/016555150202800601.