

Political Discourse Among Key Twitter Users: The Case Of Sejong City In South Korea¹

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This paper examines communication patterns of key Twitter users by considering the socially and politically controversial Sejong City issue in South Korea. The network and message data were drawn from twtkr.com. Social network-based indicators and visualization methods were used to analyze political discourse among key Twitter users over time and illustrate various types of Tweets by these users and the interconnection between these key users. In addition, the study examines general Twitter users' participation in the discussion on the issue. The results indicate that some Twitter profiles of media outlets tend to be very dominant in terms of their message output, whereas their Tweets are not likely to be circulated by other users. Noteworthy is that Twitter profiles of individuals who are geographically affiliated with the issue are likely to play an important role in the flow of communication.

Introduction

In recent years, there has been a sharp increase in the use of social media. Social media typically refers to blogs, social networking sites (e.g., Facebook and MySpace), microblogs (e.g., Twitter and Plurk¹), photo-sharing sites (e.g., Flickr), review sites, and web discussion forums (e.g., eopinions.com) (Cision & Bates, 2009).

Twitter, this study's target platform, is one of the most popular microblogging services. The design and use of the system enables individual users to frequently consume and produce text-based messages (i.e., Tweets, 140-character messages) that they consider interesting or informative and "create a looser, perhaps more natural form of social network" (Milstein, Chowdhury, Hochmuth, Lorica & Magoulas, 2008). This action is facilitated by a wide variety of devices, including websites and mobile devices. The default setting of user profiles is public, and

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thus, Tweets can be viewed by others. Twitter's application program interface (API) allows the integration of Twitter with other applications.

The easy use of social media has led to the large-scale consumption and production of online content. Social media users are now able to report stories or discuss public issues in their own cyberspace (e.g., blogs or Youtube videos) and compete with professional journalists. This trend is consistent with the argument that the Internet has suppressed the role of journalists in that the capability to access a vast range of documents and other information through the Internet has made most television viewers and newspaper readers independent of the traditional media. The Internet has contributed to a new style of news coverage of political and social issues, that is, news coverage based more on the journalist's commentary (Bentivegna, 2002).

Cision and Bates (2009) found that a majority of journalists considered social media to be (somewhat) important in producing reports and conducting online research. They also indicated that the less experienced the journalist (nine years or less), the more he or she used online metrics to judge the degree of influence of his or her reports. Thus, helping readers to become aware of a particular message is important to those who wish to assert themselves in pursuit of their goals and influence. Further, delivering messages to well-connected users enhances the likelihood of reaching a wider audience in that users have networks that can facilitate the effective dissemination of messages.

One focus of previous studies addressing the relationship between technology and society has been the diffusion of innovations. Parker (1973) discussed the information utility and social impacts of new or changing information technology. Rogers (2003) applied diffusion of innovation theory to discuss social and economic development in less developed societies or countries. However, existing approaches need to be reexamined in the context of the 'Twittersphere,' in which online content is not static and messages are continuously replaced by new ones. More importantly, although many studies have examined information diffusion in Western contexts, few have considered non-Western contexts. Thus, the present study presents the case of the Sejong City project in South Korea (hereafter "Korea") to provide a better understanding of information diffusion on Twitter in non-Western societies.

The rest of this paper is organized as follows: Section one provides a brief review of previous research on information diffusion through social media, particularly those concepts and methods proposed by scholars for identifying and measuring important users in the process of information diffusion. The second section will provide the basic information about the Sejong City project. Section three presents the data and analytical methods. Research results will be discussed in section four. The findings suggest that examining online messages by individuals who are actively involved in discussions on issues concerning their society can provide a better understanding of their reactions to those issues.

Literature review

The influence of information technology, particularly the recent advent of social media, has led to a wide range of theoretical and empirical studies. Understanding the role of technology in information dissemination is critical when one seeks to express his or her opinions more effectively. Thus, this section provides a brief overview of previous research on (1) information diffusion through social media and (2) key users as opinion leaders on social media sites.

Information diffusion through social media

A topic of special interest with respect to information diffusion over the Internet has been the effect of word-of-mouth (WOM) communication on people's perceptions of a particular product, topic, or piece of information, such as a new drug (Katona, Zubcsek & Sarvary, 2009). Keller (2010) considered the Internet to be one of the fastest-growing means of WOM communication, stating that "while about 7% of all [WOM] actually [occurred] on the internet, ... 16% of all conversations online or offline [involved] somebody quoting content about brands found online." Recently, the rapid growth of social media has changed the style of interpersonal communication. For example, more than 40% of Koreans are Cyworld² members (Katona, Zubcsek & Sarvary, 2009), and the amount of time Americans spent on watching Youtube increased 68% in 2009 (Palmiter, 2010). Personal profiles (e.g., demographic details, interests, and friends) on social media sites represent useful data for examining communication characteristics of social media.

Previous studies have examined information diffusion through social media from various perspectives, including culture (Yang, Fam & Harris, 2008), sentimental analysis (Jansen, Zhang, Sobel & Chowdury, 2009), and peer influence (Garg, Telang, Smith, Krackhardt & Krishnan, 2009). O'Riordan, Adam, and O'Reilly (2009) proposed several social network-related propositions for examining information diffusion in virtual worlds. Explicit connections such as blog-rolls (in blogs) and lists of friends (in social networking sites and microblogs) are commonly used measurements (e.g., Brown & Reingen, 1987). However, some have argued that most of the information exchange typically occurs through non-explicit, undeclared relations (e.g., Huberman, Romero & Wu, 2009; Kwon, Kim, Park, Lim & Lee, 2009). Yang and Counts (2010) discovered that Twitter plays an important role in providing references and navigation on the Web in that its links are largely unidirectional (i.e., outward). They also found that the Twitter network is more decentralized and that users are likely to form clusters locally, which may result in "limited efficiency in larger-scale information diffusion." Similarly, YouTube facilitates social exchange among online communities. Here such communities can be defined as "smart mobs," which refer to those individuals (including strangers) who are able to act jointly by using evolving communication technologies (Rheingold, 2003, p. xii) or to groups formed around particular domains of interest (Bieber et. al., 2002). Through such social aggregations, timely health-related information, for example, can be easily shared and disseminated (Ache, 2008).

Influential users as opinion leaders on social media sites

Because of information overload, individual users may have considerable difficulty reading every message and processing all the available information. Thus, intermediaries are useful for those who wish to disseminate messages more effectively.

Proposed in the 1940s, two-step flow of communication theory explains the process by which information moves from the media to opinion leaders and by which social influence moves from opinion leaders to their followers (Katz & Lazarsfeld, 1964). Opinion leaders, who filter and convey information to their followers, can be "determinants of rapid and sustained behavior change" (Valent & Davis, 1999) in people within a community. In other words, opinions leaders play a key role in disseminating information and thus influence agenda setting and public opinion. Burt (1999) pointed out that "opinion leaders are the people whose conversations triggered contagion across the social boundaries between status groups" and act as "a transition between the two network mechanisms³ responsible for [information diffusion]." Gladwell (2000),

considering different social gifts, classified opinion leaders into connectors, mavens, and salesmen. Although there are different types of opinion leaders, it is generally believed that their influence depends on issues, not personal characteristics.

Previous studies have examined opinion leaders on social media sites by considering perspectives such as network perspectives (Chin & Chignell, 2006) and methods such as the “public issue involvement-production of messages (PIIPM)” model (Park, Jeong & Han, 2008). Agarwal, Liu, Tang, & Yu (2008) combined various collectable statistics from a community blog site to measure the influence of its users. The popular Twitter service has attracted an increasing number of research efforts to examine users’ influence, which has typically been measured using demographic characteristics and the numbers of followers and followings. TwiInfluence.com, introduced in 2008, is designed for assessing a user’s influence by considering the numbers of the user’s followers and followings and has been used in various projects, including spinn3r.com/rank, which provides a list of top 1,000 Twitter users worldwide. From a social network perspective, the more the followers (i.e., indegree) of a user, the higher his or her rank is.

However, this approach (referred to as the “network structure” approach) may be problematic in that such a definition of key users does not take into account the distinctive nature of microblogging in which any users can publish stories regardless of their socio-demographic traits. Determining a Twitter user’s influence by using the number of inbound followers may “fail to identify the nuances of social interaction in the system” (Leavitt, Burchard, Fisher & Gilbert, 2009, p. 4). In other words, this approach is based on the assumption that when a user shares ties with others, the partners create ties back to the user, and the user-created content becomes more likely to be shared by the user’s friends. Although some unreliable inbound followers (e.g., spam and marketing bots) can be filtered, the network structure approach places excessive weight on the number of the user’s followers.

Taking these criticisms into consideration, Leavitt, Burchard, Fisher, & Gilbert (2009) defined the “influence on Twitter as the potential of an action of a user to initiate a further action by another user.” Kong, Park, & Han (2009) used Twitter’s communication functions⁴ to identify active, popular, and influential Twitter users in Korea. Given that user passivity is an obstacle to the delivery of messages to a wider audience in that most users tend to be silent and passive information consumers, Romero, Galuba, Asur, & Huberman (in submission) designed an algorithm for measuring a Twitter user’s influence based on his or her information-forwarding activity.

This “actor-relation” approach is related to the identification of “content reachability,” not “connection transitionability.” However, the approach is not without problems. Twitter account readership gains are not uniform globally. In other words, the relationship between users and content varies across geographical boundaries. For example, Asian and European communities are more likely to exhibit a higher degree of reciprocity than their counterparts on other continents (Java, Song, Finin & Tseng, 2007). Takhteyev, Gruzd, & Wellman (2010) discovered that Twitter users tend to make ties with others within the same metropolitan region. National borders and differences in languages are strongly correlated with patterns of Twitter relationships. This suggests that a substantial share of retweets, replies, mentions, and attributions by a Twitter user is increasingly more likely to be related to factors associated with culture or language.

Cha, Haddadi, Benevenuto, & Gummadi (2010) emphasized that time is a key variable influencing the popularity and influence of users of microblogging sites. This implies that Twitter has a dynamic structure in the diffusion of information over time and that users’ influence (or

key users) may change over time. Therefore, to better understand key Twitter users, we define key users as those who have considerable influence on their followers within a topic network on a consistent basis. In this regard, this paper addresses key users and identifies their communication patterns and social network structure by considering both the network structure and actor-relation approaches.

Importance of the research topic

This study considers the case of Sejong City because it has been socially and politically controversial and attracted considerable attention from the public and the media since 2009 and also because the current president has received criticisms for continuing to push the revised plan without taking public opinion into account (“A continued disregard”, 2010).

The Sejong City project involves the relocation of two thirds of government offices, including those of the prime minister and other ministers, to Sejong City (Chungnam Province). The original plan was drafted by late President Moo-Hyun Roh in 2005. Proponents of the original plan have argued that Sejong City is necessary for regional development. Among Korea’s seven metropolitan areas (each with more than one million residents) and nine provinces, Seoul is unique in terms of its role as a socioeconomic and cultural hub, and its population represents one fifth of the country’s population (Kim, 2010). According to Shapiro, So, & Park (2010), the excessive centralization of Seoul and its vicinity has limited the country’s innovation potential. Therefore, the Roh administration pursued the Sejong plan because they believed that successful decentralization through state intervention would lead to equal development.

At the time of data collection, however, the current Myung-Bak Lee administration proposed a revised plan centered around the relocation of several government offices to the city. Lee believed that partitioning the capital would weaken Seoul’s competitiveness and the country’s innovation capability. He suggested developing Sejong City into a center for education, scientific research, and high-tech industries. This revised plan brought about massive street demonstrations and conflicts among stakeholders in Chungnam Province. The dispute over Sejong City led to tension not only between the ruling and opposition parties but also between different factions within the ruling Grand National Party (GNP). In other words, the entire country was divided over the issue. Finally, the National Assembly voted down the Sejong City revision bill on June 30, 2010.

Few studies have examined the effect of microblogging on the diffusion of political discourse. Given that Twitter is a popular microblogging service and has been used by social and political groups to articulate information and mobilize supporters, this study is expected to provide a better understanding of the ways in which key users can be identified for a particular issue. Korea has a rapidly growing smartphone market, and social media firms have been making efforts to support their Korean users (Kang, 2010). Considering that Twitter could be the most successful “nonnative” social media in Korea⁵, the Twitter sphere is ideal for our case study. This study examines key Twitter users and their Twitter-based communication activity by analyzing their discussion of issues related to Sejong City.

Data collection and analytical techniques

Data collection

Daily Tweets on Sejong City were collected using a customized computer program between March 15 and April 12, 2010. This period was selected because this issue was again brought forward by the ruling GNP during this period and there were some arguments among various party fractions. Given that Korean messages are not well indexed in *twitter.com*, the data were collected from Twtkr (*twitterkr.com*), which works with Twitter to retrieve Tweets in Korea. Twenty key users were identified based on the number of their Tweets on the Sejong City project between March 15 and April 12, 2010.

Note that our definition of key Twitter users may appear to be inconsistent with the view that an active online user is not necessarily an influential one. However, those users who constantly posted messages about the Sejong City project during the study period can be regarded as the ones who initiated the discussion and kept the issue visible on Twitter. Thus, these users played an important role in the discussion on Sejong City.

Analytical techniques

To investigate the discussion on the Sejong City project, we used various measurement methods, including time series analysis, cluster analysis, and content analysis. We examined how key Twitter users produced messages about Sejong City over time within the issue network. The relationship and interaction between key Twitter users and other users were also analyzed. Further, we examined the effectiveness of these analytical methods in analyzing discussions about important social issues. It is expected that these procedures would provide a better understanding of the dynamics of the discourse network in the context of microblogging in Korea.

In the analysis of users' public data (their Twitter ID and location, the number of their Tweets, and lists of followings and followers), social network-based indicators and visualization methods can be used to identify key users over time and illustrate the evolving network structure of influential users (Hsu & Park, 2011). We used Krkwic (Korean Key Word in Context) and CONCOR (CONvergence of iterated CORrelations) to conduct the semantic analysis. Krkwic, a content analysis software package based on network algorithms, "classifies large-scale texts through meaningful conceptual grouping to find [frequent] words in various forms of messages" (Chung & Park, 2010). Krkwic analyzes the frequency of all words in the message (Park & Leydesdorff, 2004). CONCOR is typically used to analyze clusters of words based on "word x word" co-occurrence matrix and is capable of revealing hidden subgroups and examining the semantic structure of text (Park & Lee, 2009). We used UciNet (Borgatti, Everett & Freeman, 2002), a social network analysis tool, to draw maps showing keywords frequently appearing in the network and those frequently used by key users. We observed four types of key users' actions—sending normal Tweets, being retweeted, being replied, and being mentioned—to determine their communication traits. Note that, except normal Tweets (those by key users), the other three (i.e., retweets, replies, and mentions) refer to messages containing key users' IDs.

In sum, key actor analysis is useful for identifying social interaction patterns in complex adaptive systems (Miller & Page, 2007) in which a large number of agents influence one another. Although key actor analysis is simple and straightforward, focusing on a small subsection of an entire network may not provide a comprehensive understanding. However, the identification of

primary agents in complex social systems can reveal hidden structures, and the interaction between prominent agents can lead to a complex phenomenon such as the emergence of political demonstrations or social movements.

Results & Discussion

General users contributing to the discussion on the Sejong city project

We determined the location of users who sent at least one Tweet on the Sejong city project. The results indicate that they were located throughout Korea, including the country's four largest metropolitan areas (Seoul, Busan, Daegu, and Incheon) and several provinces (e.g., Chungnam, Kyonggi, and Gyeongbuk). Most of the users were based in Seoul, followed by Kyonggi. More than 75% of key Twitter users lived in Seoul (the capital) and Incheon/Kyonggi (neighboring areas), suggesting that people in these areas were highly concerned about the project. Sejong City is located in Chungnam Province, and thus, Twitter users in this province and its capital, Daejeon, also expressed concerns about the impact of the project on the development of the region. Further, the results indicate some evidence of geographic binding or relevance among users and provide support for Takhteyev, Gruzd, and Wellman (2010), who claimed that Twitter users from the same geographic region tend to be connected with one another. This result may be explained by the 'flock hypothesis' (Rosen, 2002) and the principle of homophily, which state that in the social interaction among individuals, those with similar backgrounds (e.g., similar geographic locations) are more likely to be linked (McPherson, Smith-Lovin & Cook, 2001).

Identification of key users

Of the 20 key users, 13 were individual users, and seven (*Users 1, 2, 4, 9, 16, 17, and 20*) represented media outlets, which included portals/search engines (e.g., Naver), online news sites (e.g., Joongang Daily), small news sites, and local media. In terms of individual users, *User 5* automatically updated articles on Naver; *User 6* was an Ohmynews journalist; and *User 18* was a news anchor at the Korean Broadcasting System (KBS), a leading public broadcaster and one of the most influential media outlets in Korea. Although the activities of *User 18* were closely related to the KBS, this user was treated as an individual user.

The occurrence of Tweets by these 20 users was examined. Here the occurrence refers to changes in the number of these users' Tweets on Sejong City. The number of Tweets on Sejong City by media outlets decreased sharply in April, indicating that the media's attention shifted to other events (e.g., the sinking of Cheonan, a South Korean Navy ship). Further, there were 5 "substantially influential" users (i.e., those who constantly sent Tweets on Sejong City). Of these, 3 were media outlets, indicating that media outlets in Korea have been extending their reach through new media, including Twitter.

The occurrence-based visibility of the 20 users and their relationship with the number of followers, the number of followings, and the number of Tweets on the project were tested by using the Pearson correlation. The 20 users' visibility and the number of Tweets on the project were significantly correlated (Pearson correlation=0.663, $p<.01$), indicating that these key users were likely to address public issues through Twitter. This suggests that in a single-issue community, users are likely to be active as news brokers and convey their views. The number of followers and that of followings were also significantly correlated (Pearson correlation=0.871, $p<.01$), indicating that 1) the key users had the ability to influence public opinion as a result of having a

large number of followers and 2) the key users paid close attention to others' opinions and established (or maintained) social relations with others.

This raises the question of whether a key user's followers and followings include other key users. In other words, do key users maintain mutual ties with one another? From the network perspective, having mutual relations with other key users may allow a key user to make his or her own opinions available to a wider audience. Moreover, important messages would be circulated more efficiently and effectively. Because users are able to shield data in Twitter's privacy settings, we were able to collect data on only 10 key users (including 4 media outlets and 6 individual users). Media outlets had fewer mutual ties than individual users. For example, except 43.73% of *User 4*'s relations with its followers were reciprocal, the three other media outlets had less than 10% of mutual relations with their followers. In terms of individual users, although *User 5* had 1.95% of mutual relations with its followers *User 3* had 38.29%, the percentage of mutual relations the remaining users was greater than 80%. This suggests that media outlets are not likely to maintain relationships with other media outlets. Given that information on various issues is available through a wide range of sources (e.g., television and websites), general users are likely to connect with individual users who provide interesting, intriguing, or fascinating viewpoints on controversial issues. This is supported by the network structure of the 20 key users, in which individual users were more likely to be connected with other individual users than with media outlets; most of the media outlets were isolated.

Types of Tweets by 20 key users

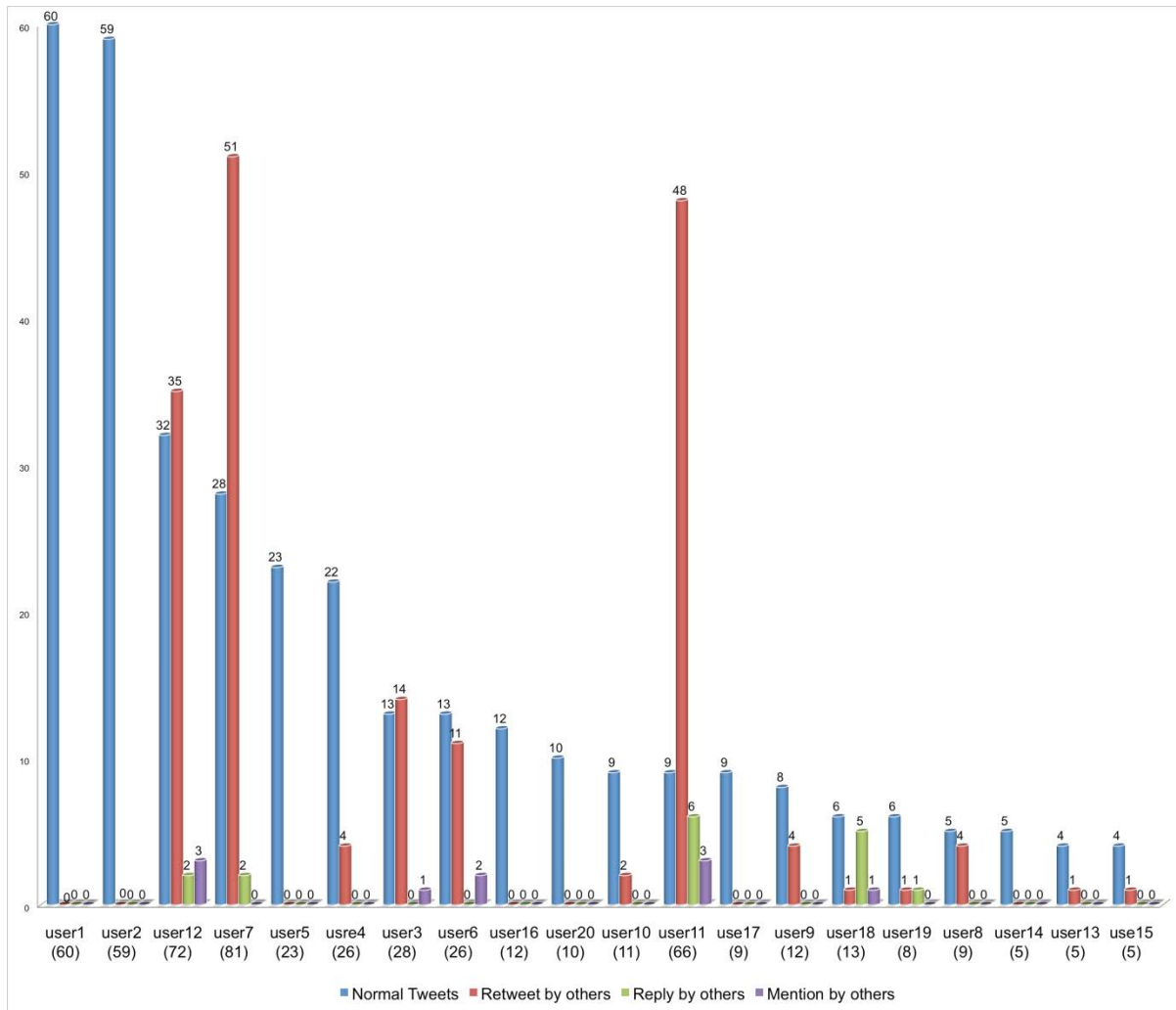
We analyzed the types of Tweets (normal Tweets, retweets by others, replies by others, and mentions by others) by the 20 key users. Figure 1 shows the numbers of these four types of Tweets, which accounted for all the Tweets by the 20 users. The number on each bar refers to the number of Tweets belonging to each type, and the number in brackets after each user indicates the total number of Tweets by the user. Five (*Users 1, 2, 16, 17, and 20*) of seven media outlets sent normal Tweets and were not referred by others. This indicates that although the media outlets made active use of Twitter to deliver the latest news, their messages did not circulate well among ordinary users and were less influential because information becomes influential and credible only when it is shared by many (Sunstein, 2009).

By contrast, individual users sent all four types of Tweets. As shown in Figure 1, *Users 11, 12, and 18* were more important and/or influential than the rest in that their Tweets included all four types of Tweets. In addition, *Users 7 and 11* had more of their Tweets reposted than the other users. These results suggest that users are more likely to interact with individual users or those users who indirectly represent media outlets (i.e., *User 18*), which has important practical implications for marketing via microblogging.

Keyword network of 20 key users

We analyzed the content of Tweets that were circulated four or more times. In general, the range of topics expanded over time, and user opinions were related not only to the project but also to several other national issues, including the Four Rivers (FR) project⁶, an ongoing government project involving the large-scale reengineering of Korea's natural landscape (Card, 2009).

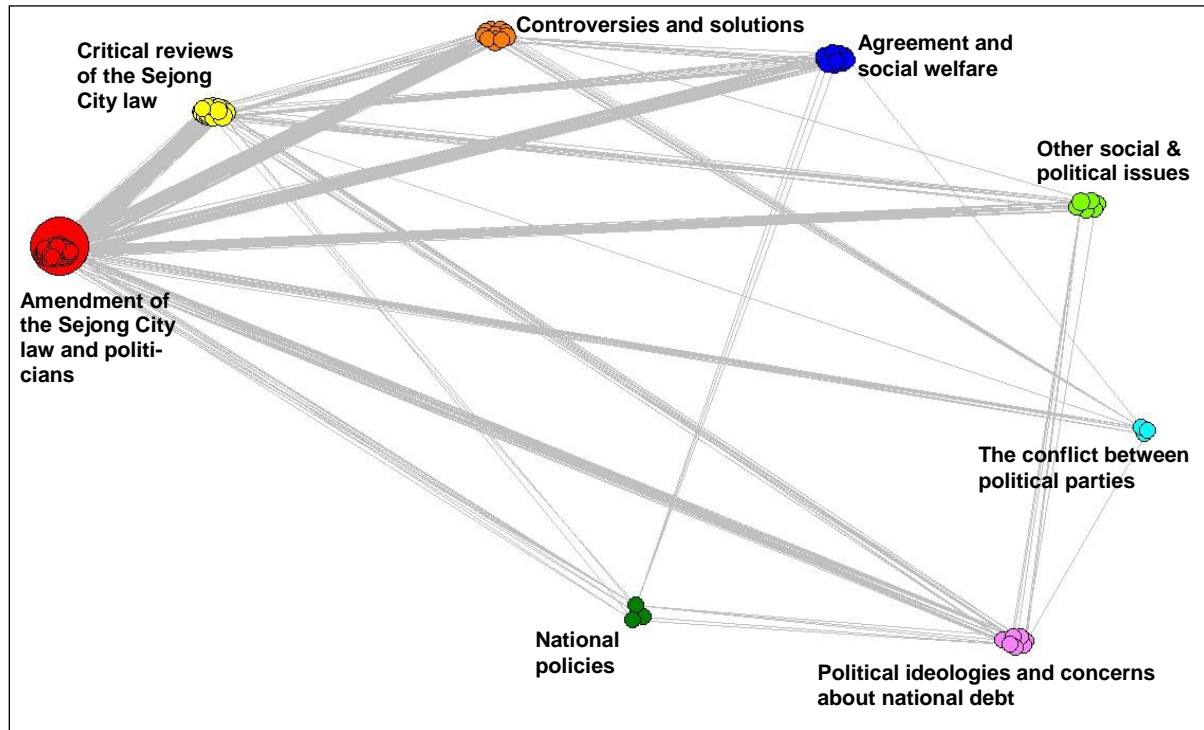
Figure 1: Twitter activity of 20 key users



A number of keywords referred to “Sejong,” the current Korean president (e.g., “M.B. Lee,” “M.B.,” and “president”), other politicians (e.g., “U.C. Chung”), political parties (e.g., “GNP” and “Liberty Forward Party”), and other issues (e.g., “4rivers” and “navy patrol boat”). The keywords reflected users’ criticisms of the government, disagreement the Sejong City project, and dissatisfaction with the government’s decision-making process. Further, to a certain extent, they reminded users of other policies or issues ignored by the government.

Some keywords for *User 12* contained hashtags (#), which often indicate issue communities on Twitter but are not widely used in Korea. The information provided by *User 12* on Twitter and his blog, indicates that *User 12* might have been conducting research on historical and social issues (e.g., he had a blog called “History & People Research”). Thus, *User 12* was likely to provide his research findings to other key users discussing the Sejong City project on Twitter.

Figure 2: Relationship among keyword clusters



We also examined Tweets by the 20 key users, including those Tweets appearing more than two times (co-occurred Tweets), by conducting a CONCOR/cluster analysis. The results indicate 119 keywords clustered into the following eight categories: “Amendment of the Sejong City law and politicians” (57 keywords); “Critical reviews of the Sejong City law” (22 keywords), “Controversies and solutions” (10 keywords), “Agreement and social welfare” (11 keywords), “Other social & political issues” (6 keywords), “The conflict between political parties” (3 keywords), “Political ideologies and concerns about national debt” (7 keywords), and “national policies” (3 keywords). Figure 2 shows the relationship among these keyword clusters. The thickness of the line connecting two clusters is proportional to the connection density of the two subgroups.

Most (66.39%, 57 keywords) of the keywords were closely related to the Sejong City project, but the keyword network also reflected other issues such as the Cheonan incident, the FR project, Dok-do Island (a territorial dispute between Korea and Japan), and the media law.⁷ This suggests that the key users paid attention not only to the Sejong City project but also to other existing policies and sociopolitical events to gain wider audiences and build political discourse by citing other controversial issues.

Conclusions

This study investigates political discourse among key Twitter users and their communication patterns by employing time series analysis, content analysis, and cluster analysis to analyze Tweets by key (or influential) users. For this, we identified 20 key Twitter users based on the number of Tweets they posted between March 15 and April 12, 2010. These users were classified as individual users or media outlets. Among individual users, several had a close relationship with me-

dia outlets in their 'real' lives, and thus, they were considered to be indirect representatives of media outlets. The pattern of linkages among the key users indicates that most of the media outlets were isolated and that they were not likely to establish ties with other media outlets. The results of the Pearson correlation indicate a significant relationship between the occurrence of these users' Tweets on the Sejong City project and the total number of their Tweets. This indicates that user passivity/activeness can influence the degree to which a Twitter user influences his or her followers and suggests that the more the user posts his or her messages, the more popular or visible he or she becomes.

The analysis of Tweets circulated among the key users indicates that although media outlets make active use of Twitter (and other forms of new media) to reach wider audiences, their messages are not likely to be disseminated among users. This suggests that media outlets consider Twitter to be just one of many PR (public relations) tools and no different from the traditional media (e.g., radio and TV). However, Twitter is a media platform reflecting a different system and thus functions differently from others. Thus, to take advantage of Twitter, PR professionals should fully understand how Twitter works and focus on key Twitter users.

Given that the key Twitter users in this study tended to represent those areas most affected by the Sejong City project, our research findings provide support for the argument that Twitter users from the same region are likely to be bound by their regional interests. That is, people from the same region are more likely to be concerned about and have a better understanding of issues related to the region than those from other regions. Twitter provides a useful, real-time tool for interested parties to communicate with one another and express their opinions about and discontent with certain issues or government policies. This is demonstrated by the results of the keyword analysis in this study. That is, the results indicate that it is possible to understand how sociopolitical issues are viewed by the general public, which has important implications for policymakers, especially those seeking reelection.

This study has some limitations. Although we identified key Twitter users by using various methods, there is a need for a better understanding of the underlying traits of such users. Because of the highly controversial nature of the issue considered in this study, many of these users might have been unwilling to provide more information on their personal background. Thus, future research should employ more qualitative data (in the form of interviews) to verify results and provide a better understanding of key Twitter users.

Notes

1. Plurk, launched on May 2010, is a social networking and microblogging service. Users can update their status by sending messages consisting of no more than 140 characters. Nested conversations and the timeline format are the main traits that make Plurk different from Twitter, the more popular microblogging service.
2. Cyworld, Korea's most popular social networking site (SNS), is said to be the first SNS in the world and is comparable to Facebook. Cyworld users can create their "minihompy," a personalized profile that is generally similar to its counterpart on Facebook (the key difference lies in Cyworld's user-friendly interface and graphic style, which appeal especially to Koreans). Cyworld provides users with a public diary, a photo gallery, an avatar, a bulletin board, a guestbook, and an area for friends to comment. It categorizes these functions into tabbed sections, which is different from the way other SNSs aggregate these options. (Park, Lim, Sams, Nam & Park, 2011, forthcoming)
3. The two-step flow of communication combines two different network mechanisms: (1) the "contagion by cohesion" mechanism, through which opinion leaders deliver information to a group, and (2) the "contagion by equivalence" mechanism, which induces the adoption of new technologies within the group (Burt, 1999).

4. Twitter's communication functions can be classified into several categories based on user actions: normal Tweets, mentions, replies, direct messages, retweets, and hashtags. According to the Twitter website (support.twitter.com), a *normal Tweet* refers to any message with fewer than 140 characters. It is also called a "Tweet." A *mention* is a Tweet containing another user's Twitter ID, preceded by the "@" symbol. A *reply* is a Tweet that begins with another user's ID and is in reply to one of their Tweets. A *direct message* is a private message sent directly to someone who follows the sender. A *retweet* is a Tweet that was reposted by someone other than the original sender. This retweet (RT) feature helps people to share information. The *hashtag* (#) can be used to create a community. Words preceded by the "#" symbol are grouped with other Tweets containing that same #word. Accordingly, hashtagged words are often trending topics on Twitter.
5. Twitter users in Korea account for 1.3% of all Twitter users worldwide. However, in terms of users receiving the highest number of replies, half or a third of the top 25 users are Koreans (Kong, Park & Han, 2009).
6. The Four Rivers Restoration Project is one of the largest infrastructure projects in Korea. The project requires an investment of US\$17.8 billion by 2010 to "restore" the four largest rivers in the country to cope with climate change, restore the riverbank environment, and boost the local economy. The government has claimed that the project would facilitate the storage of excess water for drought and water shortages, the prevention of floods, the improvement of water quality, the restoration of ecosystems, and the promotion of local tourism. More than 20 new dams are scheduled to be built on the main streams and tributaries of the four rivers. Opponents of the project have pointed out that the government's feasibility study is not thorough, is out-of-date, and has failed to show biological information on many important species living along the rivers.
7. The new Media Law, passed in 2009, has enabled more groups to enter the broadcasting industry, but monopolies and major stakeholders have remained intact. The Media Law also made the achievement of competitiveness, quality, and objectivity in the media industry an almost impossible endeavor.

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