

# ANALYSIS OF CORPORATE TWITTER USAGE TYPES AND INFLUENCE VISUALIZATION ON KEY PLAYERS

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## ABSTRACT

This research aims to analyze Twitter marketing strategies by focusing on tweets posted by four corporate Twitter accounts. We classified the posts by the four accounts into six types: daily life, general public relation (PR), event, professional information, customer service and retweet. We aimed to identify key players using an influence formula and gave a clear sense by visualization. According to the study results, retweet type is the most common among usage types, in terms of corporate tweeters; the event-type tweet was responded and retweeted most often by followers. It is expected that, based on the results of the study, a company can use the Twitter as an effective marketing tool by understanding the situation of each company and developing a customized strategy accordingly.

## KEYWORDS

Social media marketing, Usage type, Retweet, Key player, Influence visualization, ANOVA.

## 1. BACKGROUNDS AND PURPOSE

Web-based communication and mobile services through social networking services (SNS) have shown rapid growth in recent years, and the number of users has similarly increased. Hence, corporations have begun to pursue interactive communication with users via SNS while adopting a variety of marketing strategies, in order to instigate word-of-mouth promotion. Social media marketing can be seen as an obligation for company rather than an option, as evidenced by the recent growth of corporate departments specializing in SNS to promote their company's brand image, and marketing divisions' pursuit of successful adaption strategies for the utilization of SNS [1].

### 1.1 Theoretical Background

#### 1.1.1 SNS Usage Types and Viral Marketing Effects

Early research by Lee et al. considered customer participation and resource utilization as two major factors in utilizing Twitter, and defined four categories of main usage types, in order to discover whether Twitter is an appropriate medium for public relations (PR). They conducted their analysis according to the level of customer participation and resource utilization, based on the objectives and characteristics of retweet type, review type, follow type and mention type [2]. Riemer and Richer classified microblogging into record information, asking questions, sharing information and so forth, and considered this as an internal communication tool. They provided suggestions for decision makers on how to make use of corporate internal SNS [3]. Research by Jansen et al. covered viral marketing effects based on microblog postings, including customer opinions on target products, within corporate Twitter accounts. They indicated that Twitter can be used as a marketing strategy, since it can be an effective way to reach customers, who in turn might stimulate viral marketing [4]. In addition, Seo et al. focused on disseminating information, and concluded that retweets are essential for information diffusion. The research found that more retweets are obtained if the tweet contains a URL or hashtag [5]. Park et al. also focused on retweets, and defined six types of retweet motivations: social interactiveness, informativeness, acts of curation, reciprocity, timing, and information sharing. They further proposed that retweeting is the act of transferring tweets from private to public areas [6].

### 1.1.2 Key Players and their Influence in SNS

Prior research on key players and their influence in SNS mainly focuses on specific functions in Twitter, which are retweet and mention, as outlined in Table 1.

Table 1. Preceding studies on key players and their influence on SNS

Research and researcher(s)	Research Contents
Network Characteristic of Social Media Influentials [Lee et al. 2011]	Illustrated the open communication of key players on Twitter with their followers through active retweeting; analyzed network characteristics
Analysis of Twitter Usage :Twitter Influence and Corporation Usage [Cho et al. 2011]	Provided an analysis of the characteristics, influence, and usage types of Twitter users Revealed a positive correlation between followers, mentions, and number of retweets, based on an influence-measuring table
The Influentials: New Approaches for Analyzing Influence on Twitter [A.Leavitt et al. 2009]	Analyzed the usage pattern of 12 key players on Twitter for 10 days based on tweets, retweets, followers, and following, as well as the respective influence of these users
Analyzing User Interface of Microblog [Hongliang et al. 2012]	Analyzed the network between following and followers, focusing on Sina Weibo Measured the influence of users on Sina Weibo using the number of followers and user PR
Discovering Influence in Communication Networks using Dynamic Graph Analysis [A.Khraborov and G.Cybenko. 2010]	Analyzed key players on SNS and their conditions toward gaining credibility, based on the number of mentions among users in a specific period
Measuring User Interface in Twitter: The Million Follower Fallacy [Cha et al. 2010]	Suggested that the connection between users leads to overall information flow, thereby determining the influence of users Found that influence on Twitter is gained from continuous efforts rather than short-term activities

## 1.2 Research Method and Range

While the studies outlined above provide important findings on the characteristics and conditions of influencers, or key players, there has been little research that is applicable to business social media marketing strategies, since the above studies have focused on the entire Twitter user group. However, considering that the literature covers the entire Twitter user base, rather than followers of different types of corporate Twitter accounts, this type of SNS PR marketing strategy has room for improvement in terms of efficiency. To use the Twitter as an effective marketing tool, it is necessary to identify influentials among the SNS accounts of a specific company instead of the overall SNS services, to find out what kind of tweets they respond most often to, and to assess the proliferation range of their tweets. This paper thus investigates how target companies are making use of Twitter accounts by analyzing the usage types of corporate Twitter posts in order to augment previous findings. This study aims to contribute to helping companies establish specific goals for their efforts to find out what types of tweets they need to improve in the future and what kinds of influentials they need to secure and form a stronger solidarity with, by narrowing down the definition of key players and visualizing the structure of corporate Twitter accounts.

Our research focuses only on Twitter, and examines the usage types of four corporate Twitter accounts in which social media marketing strategies are actively adopted. In order to gather the data, such as tweets from specific companies, retweet information, follower information, and so on, we called Application Programming Interface and saved this in a MySQL database while applying Twitter4J in a Java environment. We gathered all tweets posted by the four companies mentioned above, which were posted from January 1, 2013 to October 6, 2013, and identified any significant differences through an analysis of variance (ANOVA) based on each Twitter usage type. We then accessed 2,258 tweets in total over three days, and saved 9,528 users' accounts. Additional data was provided by collecting information (followers, following, number of tweets, number of company retweets) on each tweet and retweet user, and arranging the tweets of the corresponding companies, along with the users who retweeted the tweets and their user information, in Excel.

The final visualization displays which types of tweets are retweeted most by high-ranking, influential followers. The visualization thus provides a ratio of the Twitter usage type for each company, their influence structure, and the key players by usage type. This study differentiated itself from the previous studies by visualizing the distribution and influence of corporate Twitter followers.

## 2. RESERCH TARGET SELECTION AND CATEGORIZATION

### 2.1 Object Selection

As of now, many companies are using the social network services for various purposes. Also, as customers follow corporate Twitter accounts for many different reasons, we tried to select companies from diverse businesses types for this study. Among them, we selected four business types-the mobile phone compnay, department store, restaurant franchise, and credit card- for this study, because these business sectors use the Twitter more actively than others. In this study, we selected the most representative company of each business type among those companies which keep keen interaction with their respective followers and which actively use corporate Twitter accounts as a marketing device. We selected Olleh KT from the communications sector, Lotte Department Store from the department store sector, Domino Pizza from the catering service sector, and Hyundai Card from the credit card sector. In terms of the number of followers and influence, the selected companies were ranked in the top five companies in their respective business sector. (Reference: the ranking service of Korean Tweeter (<http://koreantweeters.com/dir/list/0>)). The following table contains information about the Twitter accounts of the selected companies.

Table 2. Twitter information on analysis target corporations (Date of reference: 17 Nov, 2013)

Company name	Olleh KT	Lotte Department store	Domino's Pizza	Hyundai Card
Twitter ID	@olleh	@LOTTEstory	@dominostory	@HyundaiCard
Number of tweets	108,321	11,451	14,506	6,464
Following	625	31,728	10,688	39
Followers	134,284	63,986	85,349	61,787
Division	Mobile phone co.	Department store	Restaurant franchise	Credit card company

### 2.2 User Types of Twitter

Certain types of tweets by companies can be recognized. Due to the necessity to categorize the main usage types, we first examined previous research. Cho et al. classified the types into general PR message, IT information, promotional event, recruiting, customer service and retweet through analyzing the six-month-long tweet content of a specific company (Olleh KT) [13]. Furthermore, Lee categorized five usage types – investigation and marketing, customer relationship management, branding, selling, and collaboration – and made marketing suggestions for each type [14]. After reviewing the previous studies, this study analyzed the content of tweets of these selected companies, and then we created new types of tweet content or integrated several tweet types into one category. As a result, we finally selected six types of tweets. For example, we found that the tweets in relation to ‘employment’ were posted only a few times per year, and believed that this belongs to a type of corporate information. Therefore, we integrated ‘employment’ into ‘professional information.’

### 3. RESEARCH ANALYSIS

#### 3.1 Enterprises' Twitter Usage Type

In the above Twitter use behaviors (2.2), we divided corporate tweets into six categories depending on their content; Daily life type, General PR, Event type, Professional information, Customer Service, and Retweet type. A definition of each usage type and actual examples posted by the companies are shown in Table 3.

Table 3. Definitions and examples of corporate twitter usage types

Division	Definition	Sample actual tweets
Daily life type	Daily communication irrelevant to the company or its products	We would like to plant one before saying "Let's plant a tree". :D Have a nice day! #ArborDay
General PR	Events relevant to the company or services, news, and other public relations materials	[Canada Goose Moose Nuckle Jackets Pre-orders] Get a premium winter jacket in Lotte department store! Canada Goose Expedition parka \1,090,000, Steel parka \1,390,000 ▶9/30~10/9, Event hall, 3rd floor, Lotte Avinuel. Pre-orders)02-2118-6302
Event type	Events that do not require a service purchase such as a lucky draw on Twitter	[Olleh Quiz] Which plan comes to your mind on seeing the image below? ▶Hints <a href="http://t.co/kSzNX1XcGc">http://t.co/kSzNX1XcGc</a> Starbucks Ice coffee giveaways to 10 Random winners~!^^
Professional information	Professional information and reviews relevant to the company or service	[Review]Official release of iOS7, Updates and major features <a href="http://t.co/BpPkHvuNqN">http://t.co/BpPkHvuNqN</a>
Customer Service	Response to twitter users such as followers	@yjhahn yes, you can book a ticket in advance through Interpark mobile application. But mind that paying by M point is impossible on application^^
Retweet type	Retweeting tweets of other twitter accounts	RT @HyundaiCapital: 'Hyundai Capitalism' – Advertising making film of <Global Localization of Hyundai Capital> <a href="http://t.co/YKttrceZno">http://t.co/YKttrceZno</a>

#### 3.2 Comparison between Enterprises (ANOVA)

In order to conduct a comparative analysis on the Twitter use behaviors of followers, the first and second authors finally categorized tweets posted on the Twitter accounts of the four selected companies for a certain period of time, as shown in Table 3. The first and second authors personally reviewed the Twitter messages of these companies and produced six categories of the tweets for this study. They understood the classification standards better than anyone else. However, due to concerns about a possible false classification of tweets into a different use behavior type resulting from subjective judgment of the authors, we conducted a survey targeting 300 people to avoid the subjectivity problem. The 300 people were either undergraduate students or marketing professionals who had deep understanding about marketing, and their roles were to help the Twitter use behavior classification. After giving them an instruction about the classification standards and examples, we conducted a survey which asked them into what categories tweets should be classified into. We conducted a reliability analysis on the entire survey data, and the results showed that Cronbach's alpha value was found to be at 0.82, which indicates a high level of reliability.

Table 4. Numbers and proportion classified by corporate Twitter usage types

	Olleh KT	Lotte Department store	Domino's Pizza	Hyundai Card
General PR	596 (30.53%)	346 (28.9%)	215 (22.63%)	302 (40.64%)
Event type	263 (13.47%)	81 (6.77%)	255 (26.84%)	31 (4.17%)
Daily life type	21 (1.08%)	9 (0.75%)	108 (11.37%)	89 (11.98%)
Retweet type	59 (3.02%)	0 (0%)	25 (2.63%)	35 (4.71%)
Professional information	282 (14.45%)	21 (1.75%)	26 (2.74%)	129 (17.36%)
Customer service	731 (37.45%)	740 (61.82%)	321 (33.79%)	157 (21.13%)
Total	1,952	1,197	950	743

Based upon this data, an ANOVA was conducted in order to identify whether there is a significant statistical difference among the target enterprises. The results are shown in Table 5.

Table 5. Test of Homogeneity of Variance

Levene Statistic	df1	df2	P-value
3.123	3	20	0.049

The statistical variance of each company, which was identified before conducting the ANOVA, revealed a significance probability of  $0.049 < \alpha = 0.05$  this population variance reveals a difference between the number of tweets by the enterprises.

Table 6. ANOVA

	Sum of Squares	df	Mean Square	F	P-value
Between Groups	139403.500	3	46467.833	0.958	0.432
Within Groups	970171.000	20	48508.550		
Total	1109574.500	23			

The ANOVA indicates little difference in terms of the Twitter application ratio, since the significance probability is  $0.432 > \alpha = 0.05$  among the four target groups.

### 3.3 Comparison between Enterprises (Visualization)

We thus conducted an advanced visualization approach in order to discover the exact form of the data, even though little difference was shown in the Twitter application ratio for the companies in the statistical analysis. Olleh KT posted 1,952 tweets; the most frequent type appeared to be the customer service, accounting for 731 tweets (37.45%). Professional information posted by Lotte Department store accounted for 21 tweets (1.75%), and customer service tweets accounted for 740 tweets (61.82%). Customer service was most frequent in Domino's Pizza. Professional information was lower than expected, at 26 tweets (2.74%). General PR accounted for more than 40%, at 302 out of 743 tweets, for Hyundai Card, which was much higher compared to the other corporations; this can be explained by the fact that the company's tweets largely relate to concerts and musicians. With respect to the overall proportion, none of the companies exceeded 20% for the professional information usage type. The ANOVA analysis demonstrated that there was not a significant difference between companies in terms of Twitter utilization, while the visualization analysis indicated a significant level of difference between companies. However, we cannot assert that this possible difference between companies observed by the visualization analysis can reverse the results of the statistical analysis.

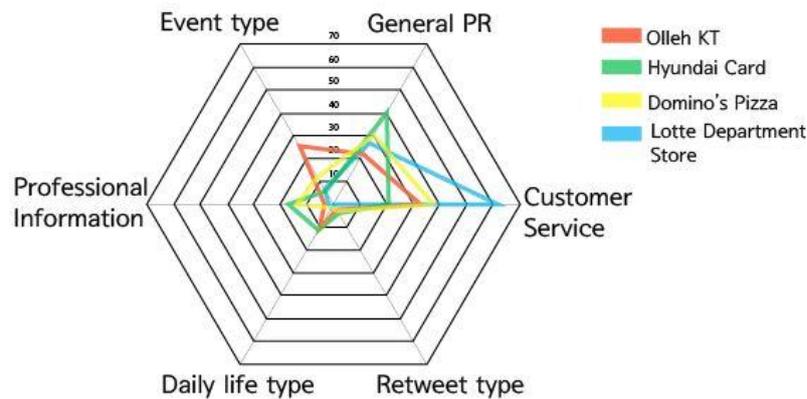


Figure 1. Ratio visualization classified by twitter usage types

### 3.4 Key Players Classified by Usage Type

It is likely that companies will be interested in the correlation between specific types of followers and usage types, as well as response frequency. When corporations recognize loyal users who are willing to give their tweets more exposure by occasionally retweeting, more effective marketing strategies will be possible. Loyal users who often retweet corporate tweets are defined here as ‘key players’. Likewise, this research highlights retweets as the most important factor in companies’ Twitter marketing strategies. We investigated the number of retweets, followers, tweets, followings and major types of retweet on 11 Nov 2013 in order to identify key players from the past 1,000 retweets on the four target companies’ accounts.

### 3.5 Information Formula

User influence in SNS is of great interest, as proven by previous studies. The influence level can be evaluated according to the subjective factors that are considered important among several functions in Twitter, as well as the number of followers and retweets (see Section 1.1). Moreover, at the 2010 World Mobile Congress, Edelman introduced the Telecom TweetLevel Index, which measures the influence of Twitter users and allows regular users to check their influence level by viewing the calculation formula on the Edelman TweetLevel website. The algorithm of TweetLevel weights factors, such as the number of followers, retweets and activities, by their level of importance. We defined the level of exposure based on factors emphasized in preceding research. Enterprises should aim to increase the exposure of their tweets. For example, if a Twitter user with 2,000 followers retweets an enterprises’ tweets three times, it will reach 6,000 additional people (computed as  $2000 \times 3$ ). Since this study illustrates that the amount of enterprise exposure from a Twitter user equals the user’s influence, the following equation will be used to estimate each user’s influence:

$$\text{Influence} = (\text{No. of followers}) * (\text{Total no. of corporate retweets})$$

### 3.6 Key Players Classified By Types

The influence formula focused on followers who retweeted corporate tweets within the past 1,000 retweets, in order to identify the key players by types. We then extracted the top 120 followers for each corporation based on their score, and analyzed which types of tweets the top 120 users retweeted. Table 7 contains data on the key players classified by usage type for Lotte Department Store’s Twitter account, and we further arranged the top 120 influencers of the four companies with the same form of Table 7.

Table 7. Top ten twitter IDs, nicknames, numbers of company retweets and main usage types.

Ranking	Twitter ID	Nickname	Number of followers	Number of Corporate retweets	Influence /100	Main types of retweets
1	kimkyochon	♡애기만세	7,790	26	2,025.4	CS
2	processic	??	24,077	4	963.08	General PR
3	hrhycho1	달비	12,111	6	726.66	Event
4	spacestarky	Space Star	4,879	12	585.48	Event
5	Dalcoming	유달콤	48,936	1	489.36	Professional Info
6	SNSD_0805	화수은화	22,733	2	454.66	General PR
7	Boxs201	박성민	289	131	378.59	PR
8	B2ST_DN	동네외계인	35,563	1	355.63	General PR
9	mongoose_	몽구스	34,851	1	348.63	CS
10	Berbba	버뮤다빠	5,848	5	292.4	CS

#### 4. RESERCH RESULTS AND VISUALIZATION

In the influence visualization structure of each company, the influence of the key players, the number of retweets, and the main retweet types are shown in terms of size, distance and node color. The left-hand image in Fig. 2 shows the colors of the nodes in a visual sense, with each color representing the main retweet type of the key players.

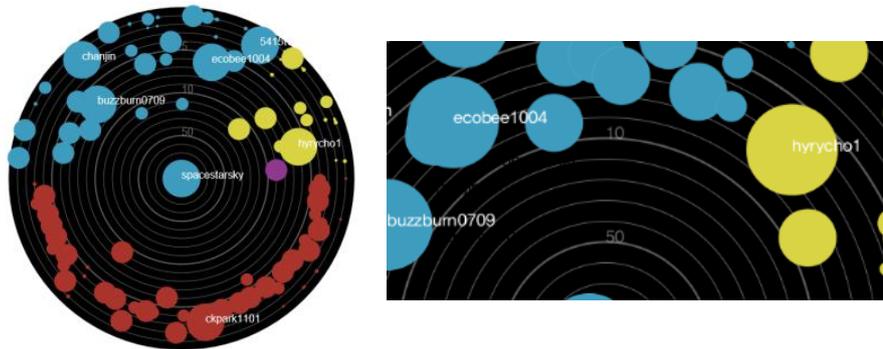


Figure 2. Twitter influence visualization of olleh KT's Twitter(left) and magnified section (right)

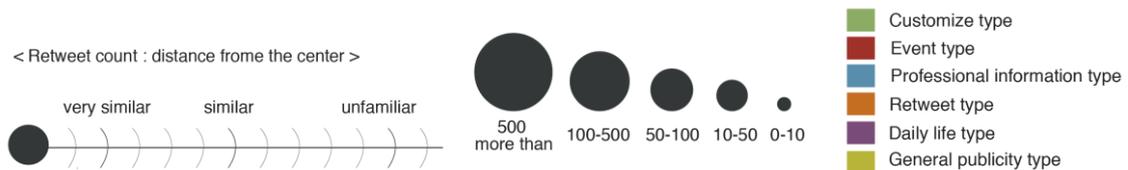


Figure 3. Colors of types regarding twitter influence visualization, distance from the center and sizes of circles.

The first image in Fig. 3 reveals the distance of the concentric circles from the center, which means the number of enterprise retweets. The most exterior line signifies key players who posted one retweet, adding another number as approaching closer to the center. The unit number is given in tens after the first 10, with 11–20 times in one column, followed by 21–30 times in the next. The unit increases by 50 if it is more than

50, meaning 50–100 times would be located in the same column, followed by 101–150 times and 151–200 times. The second image explains the size of the circles, which are classified into five levels. The circle is smallest when figure of influence/100 is under 10, and continues to increase from 10 to 50, 100, and 500.

An example influence visualization for Olleh KT, based on the concepts mentioned above, will help to facilitate understanding. For instance, a key player named ‘ecobee1004’, shown in light blue, is located in the second biggest circle, with an influence ranging from 100 to 500. This key player retweeted Olleh KT seven times, mainly retweeting information tweets.

This analysis reveals that in Fig. 2, 58 key players belonged to event, 22 to general PR, and two to daily life tweets. Moreover, 38 were categorized under professional information for Olleh KT, which has the highest portion of professional information among the four companies. The relatively sizable nodes show that Olleh KT’s key players have considerable influence. The results show a balance between professional information, event and general PR tweets.

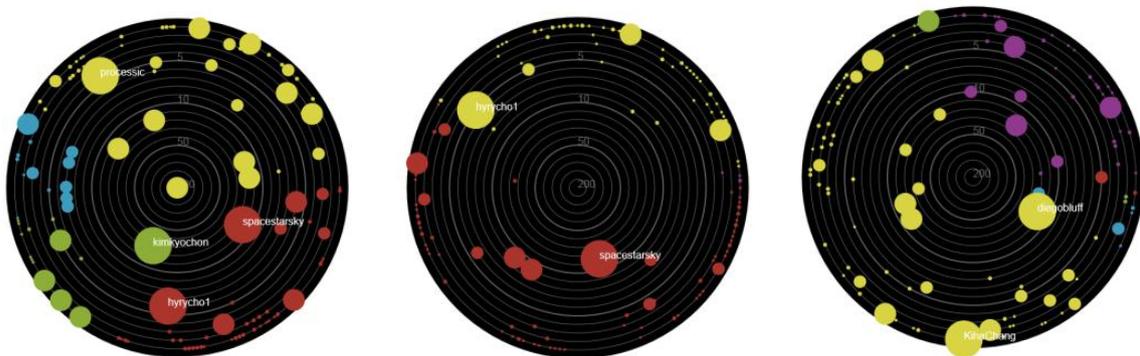


Figure 4. Twitter influence visualization for Lotte Department store (left), Domino’s Pizza (middle), and Hyundai Card (right)

Focusing on Lotte Department Store, the distribution of the top 120 key players is as follows: 14 professional information, 47 event, 43 general PR and 16 customer service. It is the only corporation for which the customer service appeared, which is believed to be a characteristic of the company Twitter account engaging in customer service. The most influential key players’ retweet type was also the customer service.

Furthermore, for Domino’s Pizza’s three key players belonged to daily life, 52 to general PR, and 65 to event. Professional information was low for Domino’s Pizza, at less than 3%.

The influence visualization for Hyundai Card is the only illustration that shows all six types, with five professional information, five retweets, 36 daily life, 70 general PR, two event, and two customer service. More than 40% of Hyundai Card’s posts were for general PR, and this was also the most retweeted type.

## 5. CONCLUSION AND LIMITATION

Our research explored social media marketing strategies based on corporate Twitter accounts, and characterized key players from the perspective of six different usage types. Influence visualizations reflected the influence of key players, and the number and type of enterprise retweets, while considering which types of tweets are mainly retweeted by each company.

The research leaves room for defining the retweet type into a single category. For instance, if a user retweeted two event-type tweets and one general PR tweet, it is questionable whether the user should be defined as frequently retweeting event-type tweets due to a difference of just one retweet. Little difference was found with respect to ‘frequently’ retweeted usage types, although the results are based on the proportion of corporate Twitter usage types.

Next, We conducted ANOVA analysis. Through this analysis, we found there was not a significant difference between companies in terms of Twitter utilization, while the visualization analysis indicated a significant level of difference between companies. However, we cannot assert that this possible difference between companies observed by the visualization analysis can reverse the results of the statistical analysis.

The visualized data showed the distribution of tweet types that key players mainly retweet, which was not covered in statistical analysis. This revealed that for Olleh KT, 31% of the top 120 key players retweeted professional information. While many followers with a great deal of influence were related to professional information retweets, they showed little loyalty. Due to their potential to become key players, their word-of-mouth communication will be stimulated if their loyalty level can be increased. Lotte Department Store posted a remarkable number customer service tweets compared to the other companies, as reflected in the influence visualization. This suggests that Lotte Department Store focuses on customer communication, which differentiates the company. It is notable that customer service tweets are spread through retweets, implying the need to consider broad audiences.

Of the target companies, only Hyundai Card reflected all. General PR accounted for more than 40%, and 58% for frequent retweet types by key players. The effect of word-of-mouth can be effectively driven by utilizing appropriate methods on this Twitter account, because of the large number of loyal followers. With respect to Domino's Pizza, the key players mostly retweeted event and general PR information, although the company adopted all usage types on their Twitter account. Key player loyalty was low here due to temporary retweets on event postings from Domino's Pizza, and the influence was not as significant as that found for other companies. Domino's Pizza should thus increase the loyalty of its followers by providing content that leads to frequent retweets, in order to achieve powerful publicity effects.

If companies are frequently retweeted by followers with low usage types, the usage types they post should be modified. Companies that have few influential key-player followers are encouraged to attract key players to the center of their activities, and players who are already influential should be maintained and reinforced through suitable communication. A company's successful use of the Twitter means that companies improves their corporate image and promotes new brands or products through the Twitter. When followers 'retweet' a message, there is an unlimited possibility of the Twitter message being proliferated to even non-followers. In the end, companies can get substantial promotion benefits through the Twitter. It is expected that, based on the results of the study, a company can use the Twitter as an effective marketing tool by understanding the situation of each company and developing a customized strategy accordingly.

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