

# **A scientometric study of Twitter**

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## **Abstract**

The aim of this research is to perform a scientometric analysis and evaluate the publications related to Twitter. The data were collected from the database of Web of Science. “Twitter” was used as the keyword to conduct the search, and all publications were mapped by the following criteria: topic and title. Publications from 2007 to 2015 were taken into account in this study, and a total of 7626 Twitter-related publications were found. The annual number of publications was increased from 5 in 2007 to 1638 in 2014. There were seven main document types in Twitter-related publications, and articles were mostly used among all document types. The United States was found to be the most productive country having publications and English was the most frequently used language among all publications. Moreover, Lecturer Notes in Computer Science was the main distribution channel and computer science, engineering, and communication were the top three most popular research areas.

## **Keywords**

Twitter, scientometric, bibliometric studies, publication trends

## **1. Introduction**

Social networking sites (SNSs) have become a crucial part of our daily life. Twitter is one of the popular SNSs that was founded on 2006 (About Twitter, 2015). It is a microblogging site in which a user can tweet 140-character messages and follow other users to read their tweets (Kwak, Lee, Park, & Moon, 2010). Worldwide, the number of monthly active users of Twitter is 284 million and 500 million tweets are sent per day (About Twitter, 2015).

In the literature, there are many studies related to Twitter. Johnson and Yang (2009) examined the motives for using Twitter. Liu et al. (2010) conducted a study that analyzed the users' continuance intention to use Twitter. Agrifoglio, Black, and Metallo (2010) investigated the role of intrinsic and extrinsic motivational factors in acceptance and use of Twitter. Cha, Haddadi, Benevenuto, and Gummadi (2010) examined user influence in Twitter comparing three measures of influence: indegree, retweets, and mentions. Skaki, Okazaki, and Matsuo (2010) studied the real-time interaction of earthquakes in Twitter and proposed an algorithm to monitor tweets and to detect earthquake occurrence. Bollen, Mao, and Zeng (2011) investigated the role of public sentiment expressed in Twitter posts on prediction of the stock market. Zhao and Rosson (2009) studied how and why people use Twitter and examined its effects on informal communication at work. Tumasjan, Sprenger, Sandner, and Welpe () studied how the content of Twitter messages reflects the offline political landscape and investigated the role of microblogging message content in determination of political sentiment. Several other studies also focused on Facebook in the literature (Bakshy, Hofman, Mason, & Watts, 2011; Boyd, Golder, & Lotan, 2010; Honeycutt & Herring, 2009; Jansen, Zhang, & Chowdury, 2009).

Although Twitter is a trend topic in the literature, to our knowledge, there has been no study that analyzes the Twitter-related publications in the scientific world. The use of scientometric methods in recent years has increased and researchers have started using bibliometric analysis to evaluate the research activities related to a particular topic (Hu, Sun, Li, & Pan, 2014). Singh and Chander (2013) applied a scientometric study of library and information science using the database of Library Management. Hu et al. (2014) characterized the pattern of publications in the area of

global electric vehicles using the database of Web of Science. Wang, Liu, and Hong (2013) conducted a bibliometric analysis of the Global Positioning System (GPS) based on the Science Citation Index and Social Sciences Citation Index databases. Ajuied et al. (2013) conducted a scientometric analysis of the publication trends in knee surgery. Carbonell, Guardiola, Beranuy, and Belles (2009) evaluated the publications trends in the areas of Internet, video games, and cell phone addiction and performed a bibliometric study using the PubMed database. The aim of this research is to perform a scientometric study and evaluate the publications related to Twitter.

The next section of this article discusses the data and methodology. This is followed by the results section. Then, this paper concludes with a discussion of the findings and recommendations for further studies.

## 2. Data and Methodology

The data were collected from the database of Web of Science. “Twitter” was used as the keyword to conduct the search, and all publications were mapped by the following criteria: topic and title. Publications from 2007 to 2017 were taken into account in this study, and a total of 11424 Twitter-related publications were found. Since Twitter was launched in 2006, the year 2007 was chosen as the lower time constraint of publications. On the other hand, the year 2017 was selected as the upper time constraint of publications because of the time frame of this study. Publications were assessed using the filters (publication year, document types, countries, language, source title, and research areas) in the website of Web of Science. Excel was used to analyze the data.

## 3. Results

A total of 11424 Twitter-related publications were determined between 2007 and 2017. The annual number of publications was increased from 4 in 2007 to 2697 in 2016. The chronological distribution of research papers is shown in Figure 1.

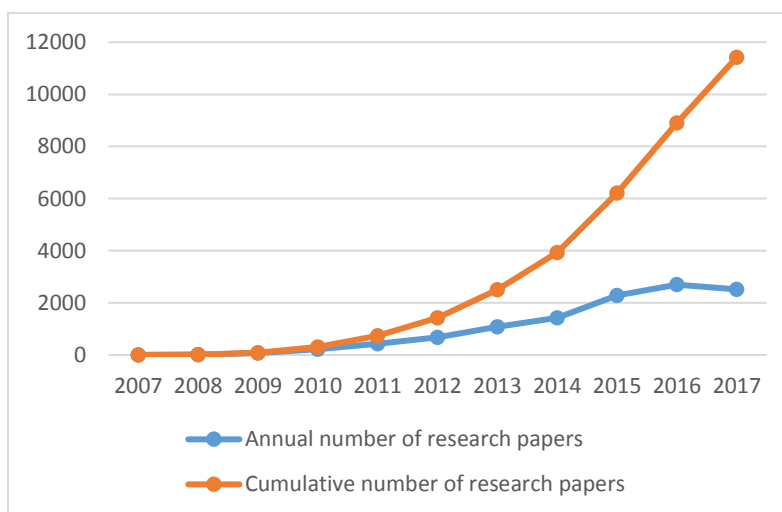


Figure 1. Chronological distribution of research papers

There were seven main document types in Twitter-related publications, and articles (5762; 50.44%) were mostly used among all document types. It was followed by proceedings papers (4580; 40.1%), book chapters (358; 3.13%), editorials (255; 2.23%), reviews (162; 1.41%), abstracts (160; 1.40%), and others (147; 1.29%). Figure 2 shows the distribution of document types.

The 10 productive countries are shown in Table 1. The United States was found to be the most productive country having 3762 (32.93 %) publications, followed by England (902; 7.90%) and Republic of China (893; 7.82%). The contributions from Spain, India, Australia, Canada, Japan, Germany and Italy each were less than 6% among all 10 productive countries. Overall, 96.09% of all publications were written in English (10977), followed by Spanish (273; 2.39%) and Turkish (41; 0.36%). Portuguese, German, French, Dutch Russian, Catalan, and Chinese were the other most frequently used languages in all publications. Table 1 shows the top 10 languages used in publications and the number of publications for each language.

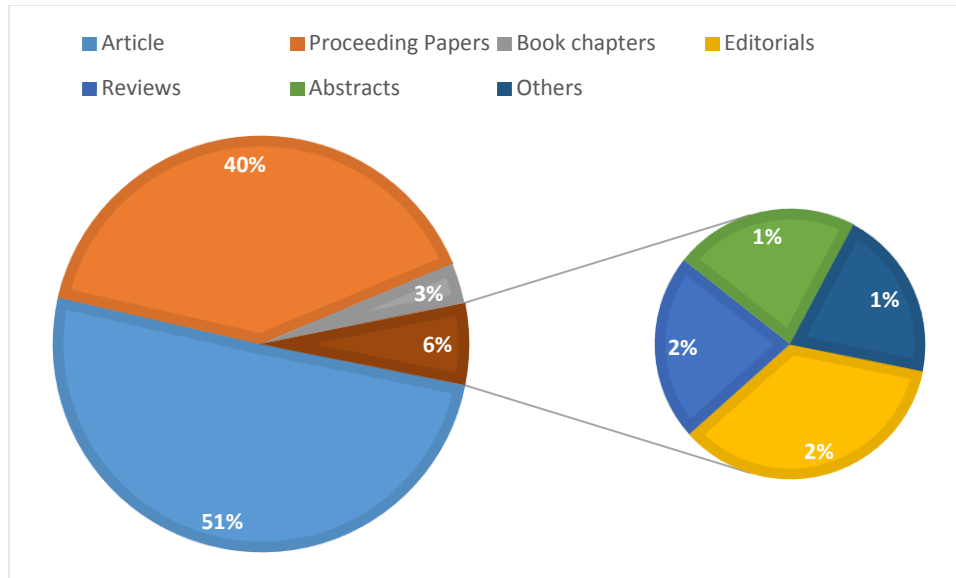


Figure 2. Document types distribution of publications

Table 1. Geographic and language distribution of publications

Top 10 most productive countries	Number of publications	% share in publication	Top 10 language	Number of publications	% share in publication
USA	3762	32.93	English	10977	96.09
England	902	7.90	Spanish	273	2.39
Republic of China	893	7.82	Turkish	41	0.36
Spain	681	5.96	Portuguese	32	0.28
India	645	5.65	German	27	0.24
Australia	565	4.95	French	19	0.17
Canada	520	4.55	Russian	12	0.11
Japan	443	3.88	Dutch	11	0.10
Germany	440	3.85	Catalan	5	0.05
Italy	367	3.21	Chinese	4	0.04

Table 2 shows the total distribution of top 10 sources that published Twitter-related research and their total publications. Lecturer Notes in Computer Science (470; 4.11%) was the top source by publication count, followed by Plos One (185; 1.62%), Computers in Human Behavior (135; 1.18%) and Lecturer Notes in Artificial Intelligence (124; 1.09%). Journal of Medical Internet Research, Information Communication Society, Procedia Computer Science, Advances in Intelligent Systems and Computing, Communications in Computer and Information Science, Social Network Analysis and Mining and each had less than 1 % share in all publications.

Twitter was taken into consideration in many different research areas, including computer science, engineering, communication, telecommunications, and business and economics. Most of the studies related to Twitter were conducted in the areas of computer science (5269; 46.12 %), followed by engineering (1985; 17.38%), communication (1200; 10.50%), information and library science (692; 6.06%), and business economics (655; 5.73%), and The top 10 research areas are shown in Table 3.

Table 2. Top 10 source distribution

Top 10 source distribution	Rank	Number of publications	% share in publication
Lecturer Notes in Computer Science	1	470	4.11
Plos One	2	185	1.62
Computers in Human Behavior	3	135	1.18
Lecturer Notes in Artificial Intelligence	4	124	1.09
Journal of Medical Internet Research	5	104	0.91
Information Communication Society	6	94	0.82
Procedia Computer Science	7	94	0.82
Advances in Intelligent Systems and Computing	8	77	0.67
Communications in Computer and Information Science	9	71	0.62
Social Network Analysis and Mining	10	59	0.52

Table 3. Top 10 research area

Top 10 research area	Rank	Number of publications	% share in publication
Computer Science	1	5269	46.12
Engineering	2	1985	17.38
Communication	3	1200	10.50
Information Science and Library Science	4	692	6.06
Business Economics	5	655	5.73
Education and Educational Research	6	610	5.34
Telecommunications	7	606	5.31
Science Sciences Other Topics	8	443	3.88
Social TechnologyOther Topics	9	356	3.12
Psychology	10	312	3.09

#### 4. Discussion and Conclusion

This study focused on the trend of publications related to Twitter. For this reason, a total of 11424 Twitter-related publications that were collected from the database of Web of Science were determined between 2007 and 2017. Publication outputs were assessed by publication years, document types, countries, languages, source titles, and research areas.

In the previous decade, there was a dramatic increase in Twitter-related publications. The number of publications was increased from 5 in 2005 to 2697 in 2016. Overall, 7 main document types were used in Twitter-related publications and articles were found to be the most frequently used document type among all publications. They were followed by patents and proceedings papers. Scientometric analysis revealed that the United States was the most productive country having approximately 32.93% share in all publications and 96.09 % of all publications were written in English. Moreover, Lecturer Notes in Computer Science, Plos One, and Computers in Human Behavior were the top three most popular distribution channels and Twitter was mainly studied in the areas of computer science, engineering and communication.

In conclusion, this study also has limitations. The database of Web of Science was used in this study. First, the data can be varied by using different databases. Second, for future studies, publication trend per year can be determined and then, the number of publications for the next few years can be predicted. Third, the publications can be assessed based on institution origin and number of authors. Collaboration of author network can also be formed for a further research.

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