

# Bibliometric Analysis: Analysis of Government Social Media Innovations from 2012 to 2023

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**Abstract.** Government social media innovation is a trend carried out as an effort to respond to needs in the era of technological development and as an effort to improve services, especially in the public sector. Therefore, government social media innovation has become one of the research topics developed in recent years. As research on the topic of government social media innovation continues to develop, stakeholders need an up-to-date perspective on government social media innovation research. The aim of this research is to provide an objective and accurate summary of government social media innovation research using 194 documents taken from the Scopus database and analyzed using a bibliometric approach. Research was analyzed by publication per year, country of contributor, subject area, author, affiliation, and source. This research uses the CiteSpace application to analyze connectivity trends on related topics using keywords and reference nodes. The results of this research are useful for identifying clusters and research in communities such as royal colleges, sustainable development, public service delivery, and other clusters. This research can contribute to the body of knowledge quantitatively and accurately in terms of contributing to the knowledge map regarding government social media innovation and can be used as material for research reviews on similar topics and developed in the future.

**Keywords:** Innovation, Social Media, Government

## 1. Introduction

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Technological developments in the last decade have made it easy to access information. Information is a basic thing that plays a role in knowledge and is able to create an educated and empowered population [1]. The need for information is a need for someone to be able to make decisions, solve problems and find facts [2]. The involvement of the internet in human life enables the development of social life online through various easily accessible platforms [3]. One of the technological advances in the field of information is social media. Social media is media that is online (online) with users who are able to interact, collaborate, and discuss with each other through the various platforms provided [4].

According to [3], the number of social media users continues to grow with an average of 13 new users every second. Significant use of social media was also reported by Kemp in [3] which stated that the number of social media users was up to 4.55 billion as of October 2021. The development of social media, especially in the user sector, has caused government agencies to also take advantage of social media to connect with their communities. According to [5], social media is able to give the government a potential to increase people's participation in democracy through encouraging the public to make policies, improve services, gather input and ideas, and increase transparency. By using social media, the government is able to disseminate information to the public, maximize public services, and involve ordinary people in designing government service ideas [6]. In the literature regarding the use of social media by the government, it is found that social media is able to provide various democratic functions for government institutions with its ability to increase transparency and public participation [7].

Even though the use of social media by the government has increased recently and various studies show that there are benefits to be derived from this, it does not rule out that the use of social media has risks [3]. Various changes that occur cannot be avoided in the midst of developments in the organization both internally and externally, including in the government environment. The development of information technology continuously causes encouragement for the government to innovate and change [8]. The only way that can be taken to deal with this is innovation [9]. Government innovation is a process for creating, developing, and implementing new ideas or steps that can provide benefits in reducing costs, efficiency, and effectiveness of government services [10]. Therefore, innovation in social media by the government is needed in the process of designing and implementing policies so that they are more comprehensive and adaptive to changing times. Innovation is needed in government social media in the form of new ideas that are relevant to changing times in order to have a more optimal impact.

Based on the explanation above, this study aims to review research trends related to government social media innovation through research published over the last eleven years based on a database taken from Scopus. Research with the hat of government social media innovation has been carried out through various approaches, but the approach through biometric analysis is still relatively limited. Scopus as a source of bibliometric analysis was chosen because it has been recognized and considered accurate and trusted by various universities and research institutes. This study will use the bibliometric analysis method to obtain the number of documents reviewed. The research material was taken from the Scopus database using the keywords "innovation", social media, and government for the 2012-2022 period, including publication trends, geographic distribution based on documents, fields of study, author contributions, and network visualization using applications. CiteSpace. This research is expected to be a reference for related research in the future.

## **2. Literature Review**

In answering the challenges of the times, innovation is needed. Until now, experts have tried to explain the basic concept of innovation. Innovation is a courage to show behavior

that is able to get out of the habit that is often done or in other words can mean behavior that has a novelty orientation [11]. In other writings according to [12] at least innovation has a relationship with two things, namely doing something new, and developing it so that it can work according to the context effectively and efficiently. Within the organizational sector, innovation has been widely defined. From an institutional theory perspective, organizational innovation can be considered as institutional change [13] Meanwhile, according to [14] organizational innovation is considered a "mode of organizational change". In this view, [15] argues that innovation is a means to improve the quality, efficiency, effectiveness and power of services, especially in the public sector by being more responsive to the needs and aspirations of service users.

Social media is a new communication medium based on information technology [16] According to [17] social media is a group of applications that have an internet base built on the ideological and technological basis of Web 2.0 which is able to create the ability to exchange content. Simply put, the definition of social media is online media that supports social interaction using web-based technology that makes dialogue interactive [18] Social media is said to be superior because it knows no boundaries and can be easily accessed at any time so that people can easily take advantage of it [16]. Simply put, social media as a new medium is able to provide a variety of various communication technology devices supported by a widely available digitization process for its users as a communication medium [19].

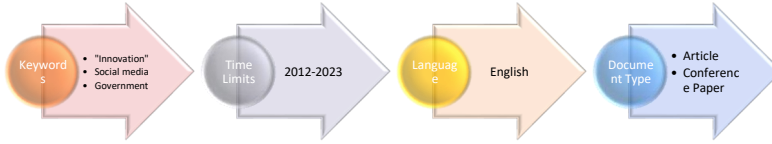
Currently, social media is becoming a new force in terms of communication, even taking an important role throughout the world [20]. As one of the strengths of government, innovation by the government is needed in social media. As a public sector instrument, social media requires innovation. According to [21], public sector innovation is the development of new creations and applications in aspects of processes, products, services, to delivery methods that have a significant impact on increasing effectiveness, efficiency, and quality. Therefore, there is a general pattern in processes, products, services and methods for delivering services to the community [11].

### **3. Method**

This research uses bibliometric analysis method. Bibliometric analysis is a popular method for analyzing a large number of scientific research by highlighting research developments on trends or areas in a particular field [22]. Meanwhile [23] states that bibliometrics is a collection of methods to easily assess the impact of scientific research publications through the micro to macro level scale. According to [24], bibliometric analysis has gained great recognition in research in recent years which is based on the linkage to the availability of advances and ease of access with bibliometric software such as Gephi, Leximancer, Citespace, VOSviewer, and scientific databases such as Scopus and Web of Science. The data in this study were taken through the Scopus database. Scopus was chosen by considering its reputation and quality which has been recognized internationally by various research institutes and universities [25]. Furthermore, this study uses the CiteSpace application to obtain a visualization map to link patterns between scientific topics in order to obtain a clearer picture of trends in certain research fields [26].

This study uses four stages in the data collection process through Scopus. In the first stage, a data search was carried out with the keywords "innovation", social media, and government. In the second stage, this study limits the search time for databases obtained over a period of 11 years from 2012 to 2023. In the third stage, this study categorizes database documents using only English. In the fourth stage, limitation of data search through data based on articles and conference articles. The data is identified based on category titles, abstracts, or keywords which produce data for 194 documents. Based on the results of

searching data through the Scopus database, it shows that 153 documents are of the type of articles (78.9%) and the rest are of the type of Conference Papers with a total of 41 documents (21.1%) published.

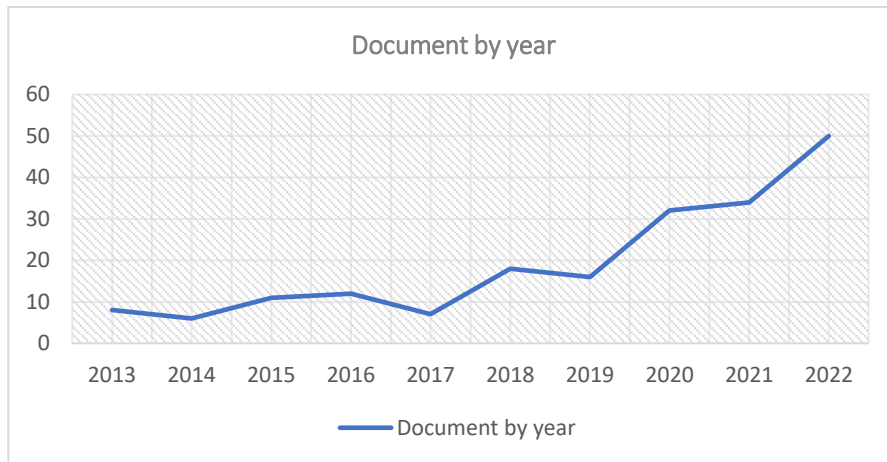


**Figure 1.** Data Mining Step

Based on the advanced query, it produces the following data: ( TITLE-ABS-KEY ( "Innovation" ) AND TITLE-ABS-KEY ( social AND media ) AND TITLE-ABS-KEY ( government ) ) AND PUBYEAR > 2012 AND PUBYEAR < 2023 AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "cp" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( OA , "all" ) )

## 4. Results and Discussion

### 4.1. Document by Year

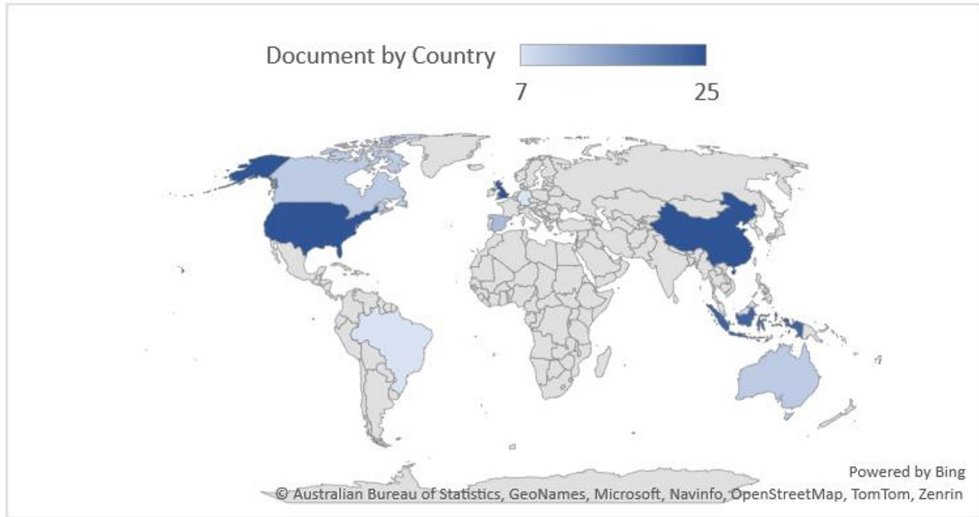


**Figure 2.** Publication by years from Scopus database

In the period from 2012 to 2023 studies on related topics experienced developments that tended to rise and fall. Based on search results through the Scopus database, researchers found 194 articles that were relevant to the keywords and strategies used. Research on related topics was first conducted in 2013 with a total of 8 publications. In 2014, this research experienced a downward trend with only 6 publications. Meanwhile, in 2015 there was an increase in the number of publications to 11 publications and there was an increase in publications in 2016 to 12 publications. In 2017, research publications with related topics experienced a sharp downward trend at 7 publications, followed by a significant increase in the publication trend in 2018 at 18 publications. Whereas in 2019 there was again a downward trend with 16 publications followed by a significant increase in publications in

2020 with 32. This upward trend continued in the following year in 2021 with 34 publications and experienced the highest trend increase in 2022 with 50 publication. The number of publications in 2022 is the highest trend compared to previous years.

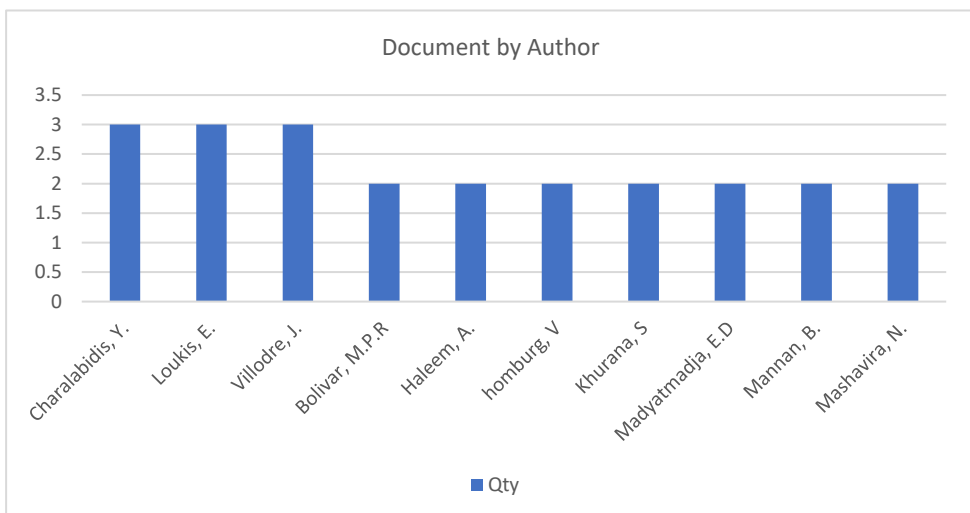
#### 4.2 Publication by Country



**Figure 3.** Publication by country from Scopus database

Based on 194 data obtained from the Scopus database, it was found that the top countries that published research on related topics were China, the United Kingdom, and the United States of America with a total of 25 publications. The next in line are Indonesia (23), Spain (12), Australia (10), Canada (10), Brazil (7), Germany (7), Malaysia (7), and others.

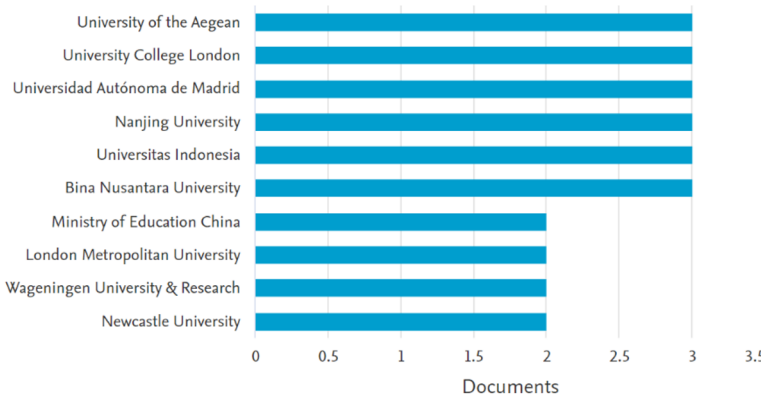
#### 4.3 Publication by Author



**Figure 4.** Publication by Author

Search results on the Scopus database show the authors with the most number of published documents on related topics are Charalabidis, Y., Loukis, E., Villodre, J. with 3 published documents followed by Bolivar, M.P.R, Haleem, A. and Homburg, V. , Khurana, S, Madyatmadja, E.D., Mannan, B., and Mashavira, N. with a total of 2 publications.

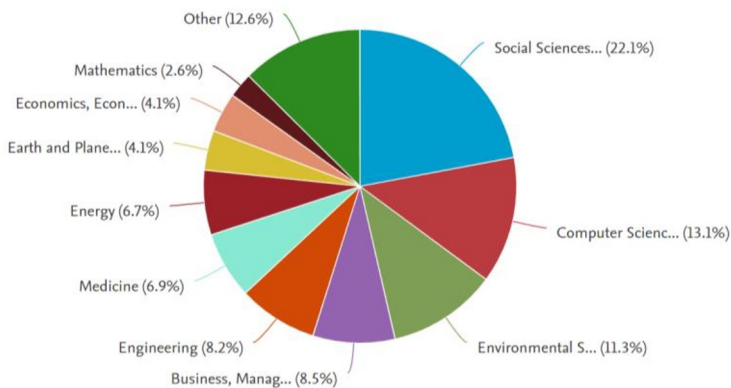
#### 4.4 Publication by Affiliation



**Figure 5.** Publication by source from Affiliation

Based on figure 4, there are document search results based on affiliation or research institution. University of the Aegean, University College London, Universidad Autonoma de Madrid, Nanjing University, and Bina Nusantara Indonesia were the top affiliates with 3 published documents. Next, the data shows that there is an affiliation with the number of document publications as many as 2 documents, namely the Ministry of Education of China, London Metropolitan University, Wageningen University & Research, and Newcastle University.

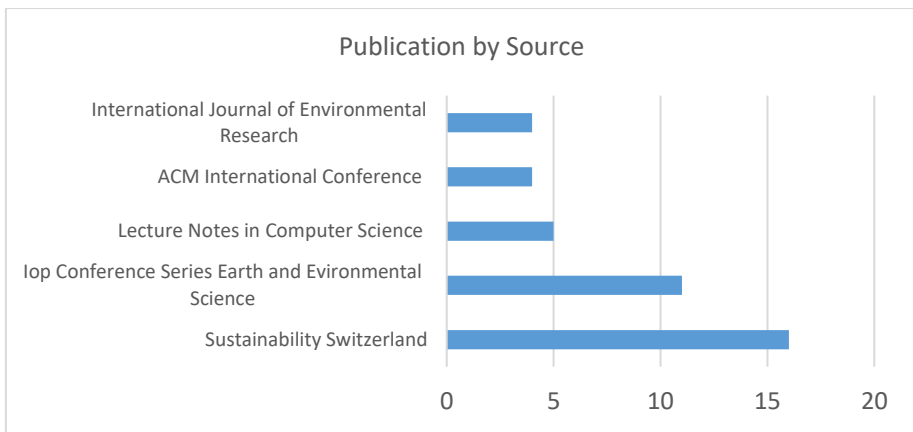
#### 4.5 Publication by Subject Area



**Figure 6.** *Publication by Subject Area*

Based on Figure 6, the Social Science subject area is the largest with a total percentage of 22.1% through the publication of 86 documents. Next is Computer Science with a total of 51 publications with a percentage of 13.1%, followed by Environmental Science with a total of 44 publications with a percentage of 11.3%. The fourth position is occupied by the Business, Management, and Accounting area with a total of 33 documents with a percentage of 8.5%, followed by Engineering with 32 publications (8.2%), Medicine with 27 publications (6.9%), Energy with 26 publications (6.7%), Earth and Planetary Sciences with 16 publications (4.1%), Economics, Econometrics and Finance with 16 publications (4.1%), Mathematics with 10 publications (2.6%) and others.

#### 4.6 Publication by Source

**Figure 7.** *Publication by Source*

In publications based on publication sources, it shows that Sustainability Switzerland contributed the most number of publications, namely 16 documents, followed by the Iop Conference Series Earth and Environmental Science with 11 documents. Next, Lecture Notes in Computer Science showed the publication of 5 documents, followed by the ACM International Conference and the International Journal of Environmental Research, each of which published 4 documents each.

#### 4.5 CiteSpace Connectivity Mapping by Keyword

This study uses the CiteSpace application to get an overview of connectivity on the topic being sought. The data obtained from the query results (in the research methods section) are exported on the Scopus web into the RIS format. RIS itself is a standard tag format developed by the Research Information System which is intended to be able to exchange data for various reference manager programs [23]. In the CiteSpace application, researchers get a visualization of connectivity based on keywords. There are 8 clusters in the topic of government media social innovation research as shown in Figure 8.

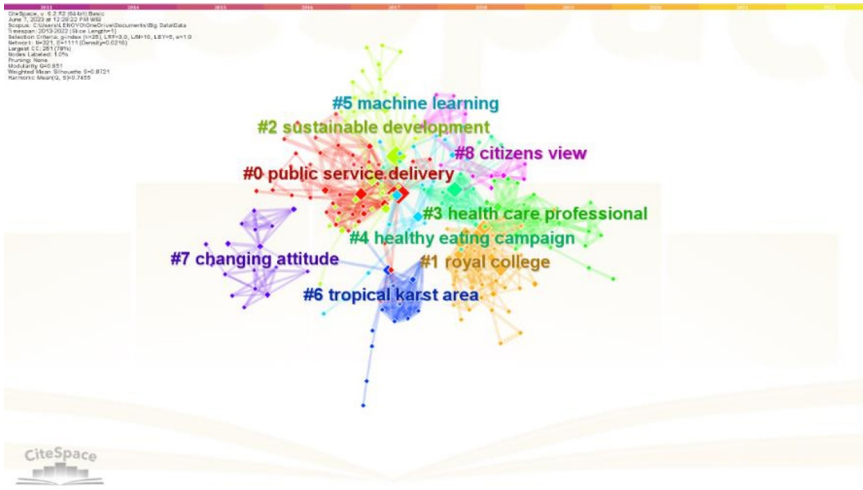


Figure 8. Mapping by Citespace

Figure 8 shows the clusters formed are cluster 0 (Public service delivery), cluster 1 (royal college), cluster 2 (sustainable development), cluster 3 (health care professionals), cluster 4 (healthy eating campaign), cluster 5 (machine Learning), cluster 7 (changing attitude) and cluster 8 (citizens view). The network is divided into 8 cocitation clusters. Clusters are labeled with index terms by citers. The following in table 1 is a summary of the 3 largest clusters.

Table 1. Largest Clusters

ClusterID	Size	Silhouette	Label (LSI)	Label (LLR)	Label (MI)
0	48	0.844	Public service delivery	public service delivery (59.07, 1.0E-4)	facebook use (1.64)
1	43	0.817	Royal college	royal college (38.94, 1.0E-4)	facebook use (0.67)
2	41	0.837	Sustainable development	sustainable development (46.03, 1.0E-4)	social media usage (1.69)

The top ranking by number of citations is (2013) in Cluster #0, with 46 citations. The second is (2014) in Cluster #2, with 42 citations. The third is (2016) in Cluster #1 , with 25 citations. The largest cluster (#0) has 48 members and a Silhouette value of 0.844. labeled as public service delivery by LLR and LSI. Labeled by MI as facebook use (1.64). the term public service has become a contested concept which can best be understood in the way the word is used and practiced in the constitution of the various countries of the world. Despite this, the function and purpose as well as the expectations of public service in terms of service delivery remain the same all over the country. Drawing from international research evidence, public services vary in terms of management, functions, and uses. In this cluster there are the most discussions covering social media (46), social networking (14), and big data (7). The purpose of this cluster is the delivery of public service delivery to focus on discussions in the realm of social media, social networking, and big data as a support for public service delivery [27].



The second largest cluster (#1) has 43 members and a silhouette value of 0.817. Labeled as royal college by LLR and LSI and facebook use (0.67) by MI. Royal college addresses elite education and development innovation based on empire. Most cited in this cluster are human (25), article (21), and Covid-19 (21). The discussion of royal colleges focuses on discussing health, surgery, and science in royal campuses [28].

The third largest cluster (#2) has 41 members with a silhouette value of 0.837. Labeled as sustainable development by LLR and LSI and as social media usage (1.69) by MI. Sustainable Development has broad appeal and little specificity, but some combination of development and environment as well as equity is found in many attempts to describe it. However, proponents of sustainable development differ in their emphases on what is to be sustained, what is to be developed, how to link environment and development, and for how long a time. Most cited in this cluster are innovation (42), sustainable development (14), and small and medium enterprises (7). In this discussion, sustainable development relates to innovation, sustainability, and enterprise as a discussion [29].

## 5. Conclusion

The purpose of this study is to be able to provide an objective and accurate summary of the domains in research on the topic of government social media innovation using 194 documents based on related data obtained through the Scopus database with a time span from 2012 to 2023 and visualized through the CiteSpace application to obtain visual overview of the connectivity of keywords and references. The data obtained from the Scopus database are document publication data per year, publications by author, publications by country or territory, publications by source, publications by affiliation, and publications by area. The results obtained are findings indicating that there are research clusters on related topics, such as public service delivery, royal college, sustainable development, and other clusters. These results are useful for identifying clusters and research topics related to government social media innovation. It was also found that research on the topic of government social media innovation has developed and increased every year, although it had experienced a significant decline in certain years. Nonetheless, developments and improvements in research can contribute to understanding the underlying structure of the field concerned. As for this article, it can contribute to the body of knowledge quantitatively and accurately in terms of contributing knowledge maps regarding government social media innovations based on a knowledge base using bibliometric data. While the methodology used in this article can be used in general as a tool to map scientific disciplines effectively compared to the traditional literature review method that was often used before. The researcher suggests that future research will be able to periodically improve the knowledge map related to the field of government social media innovation that has been provided in this study.

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