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Bibliometric Analysis of 5G Nircable Networking Technology

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ABSTRACT

Technological leadership is the most important factor in the current technological development in Indonesia. One of the greatest technological advances of the modern era is the emergence of 5G wireless networks, which significantly increase network capacity, speed, and efficiency. This is the most important factor in the development of smartphone communication technology. With a latency that is noticeably higher than 4G, users can download and upload files in a significantly shorter amount of time. This study uses bibliometric methods with the aim of analyzing the capabilities of 5G wireless technology from related studies.

Keywords: *Bibliometrics, 5G Networking, 5G Wireless Networking, Technological Advancement*

1. INTRODUCTION

Everyone needs the Internet because it's so easy to use—you can quickly find information on a variety of websites, for example—and because more and more people are using it on computers, smartphones, tablets, and 5G networks, which provide faster internet speeds than earlier Internet technologies. [1] One of the key facets of information and communication technology development in the twenty-first century is the evolution of Internet networking technologies. The quick 4G LTE (Long Term Evolution) Internet network, which is presently widely utilized in smartphones and other devices, is the ancestor of the 5G network [2]. It is anticipated that 5G networks, or the Fifth Generation, will function and connect far better than 4G networks, which were the previous generation of mobile networks.

The following comprehension is necessary for the development of 5G Internet networking technology:

1. Extraordinary speed and latency: The key features of 5G networks are exceptionally low latency and very fast data throughput. Greater data speed makes it possible to upload and download content more quickly, and reduced latency means that there are fewer delays between the sender and the recipient of the request, facilitating faster interaction [3].
2. Internet of Things (IoT): A vast array of IoT devices, including IoT gadgets, are intended to be supported by 5G networks. This will facilitate the expansion of Internet of Things applications, including linked health systems, smart household appliances, and driverless cars [4].
3. Augmented Reality and Virtual Reality: The use of augmented reality (AR) and virtual reality (VR) will be changed by 5G networks. Content for AR and VR may flow naturally and offer a more in-depth experience.
4. Industrial Transformation: A number of industries, including transportation, manufacturing, agriculture, and health, stand to gain from 5G networks. The usage of more sophisticated technologies, such factory automation, driverless cars, and remote healthcare, can be aided by its dependability and speed [4].

5. Security and Privacy: As 5G networks develop, new issues with data security and privacy will also arise. There are more linked gadgets, which increases the potential hazards to user privacy and data security.
6. Infrastructure: Significant infrastructure investments are needed for the development of 5G networks, including the placement of more frequent 5G base stations and improved fiber optic infrastructure. Cost and licensing issues may arise as a result of this [5].
7. Sustainability: It will be essential to think about strategies to lessen harmful environmental effects, such as excessive energy use and electronic disposal, if 5G networks are to continue to be sustainable [6].
8. These days, wireless communication that can connect to high-speed internet and transfer data at faster speeds is essential to society's demands [7].

2. METHODS

The study of literature, or literature reviews, is the approach used in this research. The literature review, which attempts to summarize, analyze, and interpret concepts and theories important to this research, is a study of libraries and various publications related to the research subject.

1. The journal's reputation
   Well-regarded publications have been chosen thus far, and the selection process is ongoing. The results of the journal inspection are displayed in Table 2.

Table 2. Journal profile with a focus on 5G technology advancements.

Point Of Viewer	JBPI	WISK	JSISFOTEK	Journal Ambient Intellegence	ITEJ	Computer Network	IEEE	IEEE
Publisher	Ejournal.kreatif.cemerlang,id	Warta-iski.or.id	Jsisfotek.org	Springer	Journal.digitus.id	Elsevier	ieeeexplore.ieee.org	Ieeeexplore.ieee.org
First published	2023	2019	2023	2022	2023	2020	2019	2019
Last published	2023	2019	2023	2022	2023	2020	2019	2020
Scopus Indexed	No	No	No	Yes	No	Yes	Yes	Yes
Web of Science Indexed	No	No	No	No	No	No	No	No

2. The Metrik Journal
   This section displays the profile and metrics from the two journals that were examined: OTIOMS, MS, and IJORE. Table 3 presents some important points that should be understood from the three journals that are examined. This metric information is derived from data collected using the Publish or Perish application.

Table 3: The Extracted Metadata from The Journal Article

Metriks data	JBPI	WISK	JSISF OTEK	Journal Ambient Intelleg ence	ITEJ	Compu ter Netw ork	IEEE	IEEE
Publication years:	2023-2023	2019-2019	2023-2023	2023-2023	2023-2023	2020-2020	2019-2019	2020-2020
Citation years:	1 (2023-2023)	4 (2019-2023)	1 (2023-2023)	1 (2023-2023)	1 (2023-2023)	3 (2020-2023)	4 (2019-2023)	3 (2020-2023)
Papers:	1	1	1	1	1	1	1	1
Citations:	3	38	0	208	0	651	1147	872
Cites/year:	3.00	9.50	0.00	208.00	0.00	217.00	286.75	290.67
Cites/paper:	3.00	38.00	0.00	208.00	0.00	651.00	1147.00	872.00
Cites/author:	1.00	38.00	0.00	208.00	0.50	162.75	573.50	174.40
Papers/author:	0.33	1.00	0.25	1.00	2.00	0.25	0.50	0.20
Authors/paper:	3.00	1.00	4.00	1.00	0	4.00	2.00	5.00
h-index:	1	1	0	1	0	1	1	1
g-index:	1	1	0	1	0	1	1	1
hI,norm:	1	1	0	1	0	1	1	1
hI,annual:	1.00	0.25	0.00	1.00	0.00	0.33	0.25	0.33
hA-index:	1	1	0	1	0	1	1	1

3. The Manager of Reference
   After selecting an article from a different website, use Mendeley's tool to create a reference. To make writing style, abstrak, detail, and other information clearer and more understandable, as well as comprehensive for every article that will eventually be used as a reference.
4. A Bibliographic Analysis
   Once all article metadata has been verified, the next step is to do a bibliometric analysis using VosViewer.

3. RESULTS AND DISCUSSION

Using VOSViewer software to determine the type of data, the researchers created maps based on bibliographic data to describe the progress of wireless network research on 5G. Next, we read data from reference management files that have RIS-compatible file types in the data source. Next, apply the complete calculation for the calculation method, with a maximum of 26 authors per document and a minimum of 1 author per document. As a result, 26 of the 26 writers qualify.

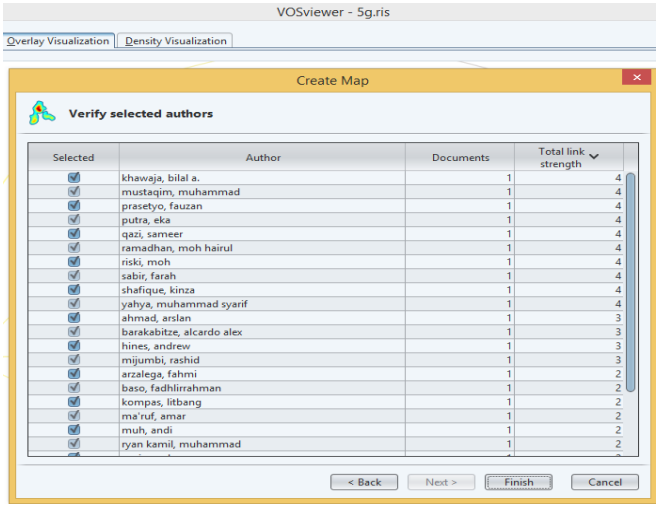

Figure 1. Finding the Most Effective Researcher

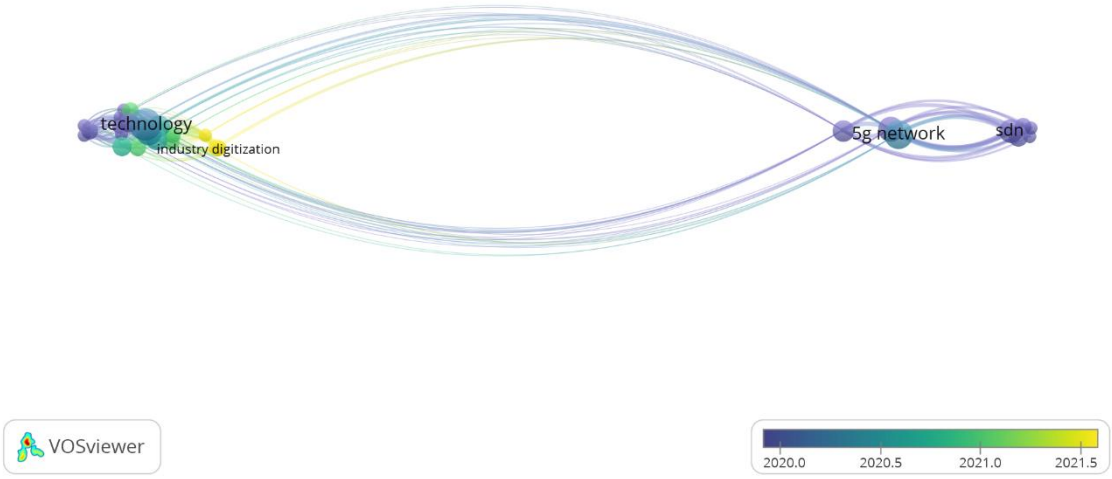

Figure 2. Keyword Network Visualization Map

Figure 2 depicts several groups as purple, blue, green, and yellow. Throughout the article, a few of the most popular cluster words are highlighted. According to this cluster, there are three published article categories as of right now. There is more information in Table 4.

Table 4: Keywords and clusters

Cluster	Total items	Most frequent keywords (occurrences)	Keywords
1	17	technology (11)	5g iot scenario, 5g iot system, 5g system, augmented reality, challenge, detail, fifth generation, heterogeneous network, hetnet, high data rate, internet, qos role, technology, thing, wireless technology, world
2	8	5g network (9)	5g network, future challenge, management, nfv, requirement, sdn, softwarization, term
3	4	intelligent automation (3)	artificial intelligence, evolution, industry digitization, intelligent automation

To ascertain current trends in 5G wireless network research, we can look at responses that were taken straight from the cluster. Figure 2 displays an article density visualization. In Cluster 1, the word "technology" is most frequently used.

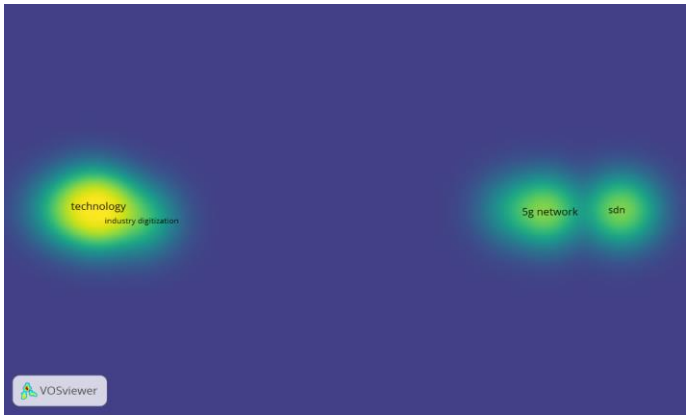

Figure 3. Keyword density visualization map

At least in keywords, one of these mapping clusters—cluster 1—is present. This cluster covers the topic of 5G wireless network "technology". Furthermore, some words are infrequently found in keywords inside any cluster, such as "5G iot system," "5g system," and so on. Stated differently, there remains a research vacuum that will likely contribute to future trends—trends that are, of course, tailored to the circumstances of the world today and tomorrow.

CONCLUSION

In the current study, several works with themes pertaining to the wireless network "5G" are examined. This article's data came from IEEE Access, Computer Network, Journal of Ambient Intelligence and Humanized Computing, and IIEE Internet of Things. Our analysis indicates that 5G networks will have a significant impact on global technological advancement, particularly in the areas of industry, technology, and communications. Artificial intelligence, evolution, industry digitization, intelligent automation, augmented reality, and the Internet of Things are all made possible by 5G technology.

The current study is flawed in at least two ways. First of all, despite the use of formal tools in the research (PoP software, VOSviewer, and Mendeley), the authors' subjective assessment is still present and can result in erroneous identification. The primary source of data for this study is limited to journals with Scopus indices as well as those without. Subsequent investigations have to employ intricate sample sizes encompassing multiple sources that are not encompassed in the Scopus index.

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BIOGRAPHIES OF AUTHORS

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Please attach clear photo (3x4 cm) and vita. Example of biographies of authors (9 pt):

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