SCIENTIFIC EVOLUTION OF KNOWLEDGE MANAGEMENT IN META-ANALYSIS STUDIES

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Abstract

Knowledge management is the process of creating, utilizing, maintaining and sharing knowledge in improving the quality of organizational resources. Knowledge management is part of the organization's strategy by utilizing its knowledge assets in order to achieve the goal of strengthening competitive advantage. Qualitative methods are applied through the development of meta-analysis to produce new research and new topics that can be further developed in accordance with the specified period. Scientific evolution is carried out through the analysis of scientific journals published in the last eight years on the concept of knowledge management. Several topics that have novelty were produced in this study to encourage further knowledge development, especially in the development of knowledge management including strategic knowledge management, knowledge flow, knowledge management literature, knowledge management capability, knowledge workers, knowledge management practices, knowledge management processes, human capital and value creation. Efforts to follow up the concept of knowledge management are important to do to enrich the diversity of knowledge resources possessed in order to improve the quality of human resource development.

Keywords: knowledge management, knowledge flow, knowledge development, scientific evolution, meta-analysis

Introduction

The dissemination of research publications on the theme of knowledge management in the last eight years has become an interesting study by researchers in various regions of the world, especially competing to win global competitiveness. Knowledge management is one of sources to achieve competitive advantage and as strategically oriented development [1, 2], help determine the direction and level of competitiveness in business[3], source of innovation that plays an important role in business environment[4], helps organizations improve capabilities through better use of knowledge resources [5, 6] need for integration of risk-based understanding and knowledge management in order to reduce business process risks[7]. The general description presented in the research with the theme of knowledge management studies a lot about business processes and the readiness of various risks faced in uncertain conditions and utilized digital technology in business development. Although presentations from various aspects of research have been studied, various problems related to knowledge management are still the focus of various studies that are currently developing.

Some of the problems faced in knowledge management can be taken into account in the development of knowledge that can affect the business environment in the future, including the relevance of current educational curriculum to the needs of industry [5], mismanagement and lack of knowledge sources that have an impact on poor results obtained (Mikovi et al., 2020), knowledge sharing and knowledge exchange are still inadequate in knowledge management process as an effort to improve organizational effectiveness and efficiency [8, 9], lack of data compatibility and multiple concept definitions reduce the exchange of information and can be a barrier to problem solving [10]. Solutions have been followed up to obtain more effective and efficient knowledge management in several research cases, including efforts to establish a data mining and storage system by utilizing fuzzy quality function deployment [11, 12], implementation of fuzzy analytical hierarchy process as a strategy in adopting knowledge management to solve supply chain obstacles [13] the concept of analytical network process is applied for continuous knowledge transfer especially in the development of literature review [14].

However, some of the solutions that have been given in previous research with the uniqueness and specificity of each of the existing solutions still partially answer the problem so that a new strategy is needed to provide a more comprehensive solution in dealing with increasingly complex conditions. In the context of knowledge management development, it can be done by implementing new strategies through scientific evolution of knowledge in order to improve the quality of human resources in order to create an increasingly challenging business environment. Business process development needs to strengthen knowledge management as part of resource management that can be done through the use of digital technology. Therefore, scientific research on the concept of knowledge management is important as a step to develop existing resources in collaboration with current digital needs so that the development of knowledge and technology can be carried out to improve the quality of human life. For this reason, knowledge development is still needed through the expansion of studies and the discovery of new topics that are relevant and closely related to knowledge management so as to be able to create new knowledge and deepen knowledge for further research development. Scientific evolution has a vital role in generating new knowledge so that it can be useful for improving the quality of resources through strengthening the concept of scientific thinking.

Methods

Business process development is the only thing that can be done through knowledge management implementation effectively and efficiently. One way to improve knowledge management implementation can be optimized with a scientific evolution mapping pattern. The scientific evolution of the concept of knowledge management is presented in a qualitative approach through the analysis of scientific journals. For this reason, qualitative methods are applied to analyze scientific literature as main data sourced from the collection of various scientific journals that are relevant to the topic being studied. Bibliometric analysis was implemented for knowledge mapping [6, 8, 10, 15] generate in the form of a bubble map equipped with visualization of results [16] measure keywords and co-citations [5, 17]. The study through the scientific evolution of journal publications aims to find out topics that are trending and are expected to be needed in the future in developing the concept of knowledge management. Knowledge dissemination is an urgent need in its contribution to improving the ability of individual mindsets in facing various challenges in uncertain and ever-evolving conditions, for that reason it is necessary to expand the concept of knowledge management so that it can be utilized for future generations. Scientific evolution of the concept of knowledge management as an effort to develop and expand knowledge is implemented in this research.

VOSviewer is used as a tool to analyze research data sourced from a collection of scientific journals from various searches that can be presented through interactive and attractive visualizations. VOSviewer generates publication mappings in the form of visual

elements[18]. The systematics of collecting research data was obtained from the publication of scientific journals in October 2021 with the topic of knowledge management. Scientific searches to obtain data are carried out on journal publications during the last eight years or the journal publication period from 2013-2020. The data of scientific journals that have been collected through scientific searches amounted to 7949 through the input of keyword knowledge management for scientific searches of journals that have been published in a predetermined time span. Time span of journal publication for the last eight years is attempted to monitor the development of new knowledge topics in detail which can be seen changes per year. Novelty of the topic is expected to be obtained in the process of scientific evolution which is presented in the form of visualization. Evolution of knowledge for knowledge management concepts obtained from the results of analysis for scientific journal publications is directed to produce several new topics that are expected to have novel value so that they can be grown further for future knowledge development.

Results and Discussions

Scientific journal data that has been successfully collected on the concept of knowledge management obtained through input on keywords is presented in the form of interactive and interesting visualizations. Searching keyword knowledge management from various publications resulted in 7949 scientific journal articles that were used as research data with a time span of publication for the last eight years or journal publications from 2013-2020. Publication monitoring is carried out annually for eight years in order to simplify the analysis of scientific journals related to scientific evolution that occurs so that publication trends can be shown through the novelty of topics generated. VOSviewer is used a software to analyze topics that often appear and new topics that are still rarely studied in the concept of knowledge management. The advantage of using VOSviewer in the analysis of scientific journal publications is the form of visualization that is produced interactively and attractively, making it easier to understand and implement the intent based on display. This convenience is expected so that we can find out trends in research topics that develop during the time period of publication and also to get new topics that are not widely known so that it is very possible to follow up for future knowledge development.

Table 1

Scientific journal publication time period

Publication year	2013	2014	2015	2016	2017	2018	2019	2020
Papers	998	997	996	998	996	994	984	986
Citations	24151	19307	19618	17601	16477	14359	10886	4419
Cites/year	3018.88	2758.14	3269.67	3520.20	4119.25	4786.33	5443.00	4419.00
Cites/paper	24.20	19.37	19.70	17.64	16.54	14.45	11.06	4.48
Authors/paper	2.33	2.31	2.26	2.29	2.35	2.44	2.52	2.62
h-index	76	70	68	69	66	61	48	27
g-index	133	111	116	110	101	89	77	40
hA-index	24	23	24	26	28	32	31	27

The division of scientific journal publication time period refers to the last eight years as presented in table 1. The total number of scientific journals analyzed was 7949 with the number of citations obtained during the publication period of 126818, the average value of cites/year was 3916,809, average value of cites/paper as much as 15.93, and the average value of authors/papers is 2.39. In addition, the evaluation of journal publications on quality produced can be measured by several categories including an average h-index of 60,625, average g-index of 97,125, and average hA-index of 26,875. Data on the number of scientific journals published per year looks relatively even, but the

number of citations in 2013 looks more than in the following years. This indicates that a longer journal publication period will result in a greater number of citations so that latest publication period has a relatively small number of citations because it is not widely known and referred to by academics and researchers. Benchmarks for the development of scientific works and the quality of scientific produced for academics and researchers are measured based on high index value obtained.

Cluster	2020	2019	2018
1	Absorptive capacity, customer knowledge, supply chain management, systematic literature review, business performance, complexity	Artificial intelligence, innovation process, learning organization, social capital, project management	Explicit knowledge, tacit knowledge, knowledge acquisition, knowledge storage, dissemination
2	Artificial intelligence, big data, digital transformation, organizational capability, organizational environment, creativity.	Knowledge management capability, knowledge management initiative, organizational commitment, business process	Business performance, customer satisfaction, human capital, market orientation, total quality management
3	Explicit knowledge, tacit knowledge, value creation, self-efficacy, project management, knowledge worker	Tacit knowledge, explicit knowledge, organizational development, information system, public sector organization	Business intelligence, customer relationship management, innovation process, knowledge discovery, social media
4	Knowledge application, knowledge flow, strategic knowledge, strategic management, open innovation	Knowledge management literature, knowledge management infrastructure, competitiveness, new knowledge, sustainable development	Knowledge management implementation, knowledge management perspective, entrepreneurial orientation, new knowledge
5	Organizational effectiveness, organizational structure, knowledge management infrastructure, transformational leadership	Value creation, human resources management, systematic literature review, readiness	Communication technology, competitive environment, innovation capability, knowledge hiding, big data
6	Knowledge integration, knowledge hiding, organizational behavior, enterprise resource planning, knowledge intensive organization	Business environment, customer knowledge, dynamic capability, intellectual capital, intangible asset, knowledge asset, social network, product innovation	Talent management, empowerment, organizational innovation, creativity, social capital
7	Communication technology, entrepreneurial orientation, information system, profitability, total quality management, service sector	Communication technology, innovation performance, market orientation, entrepreneurial orientation	Organizational learning, transformational leadership, leadership style, sustainable development, human resource management
8	Technological innovation, information resources, sustainable development, empirical investigation	Knowledge sharing practice, knowledge transfer, organizational innovation, transformational leadership, empowerment	Knowledge management literature, knowledge management capability, innovation performance, competitiveness, value creation, knowledge society

The clustering of knowledge management concepts as result of analysis is carried out in latest publications that find various research topics that often appear and have novelty which are shown in table 2. The trend of research topics from analysis in last three years shows that there are many similarities in the topics studied, including communication technology, explicit knowledge, tacit knowledge, and sustainable development. In addition, there are several research topics that have novelty so that they have not been widely researched and published, including knowledge flow, entrepreneurial orientation, new knowledge, knowledge society, and strategic knowledge. There are many similarities in research topics resulting from the analysis of scientific journal publications in the last three years, which means that they are still being considered in efforts to develop knowledge through scientific evolution.

Table 3.

The highest number of citations in scientific journal publications 2013-2020

TC	APY	Title	Source Journal	Authors	Year
742	123.67	A review on evaluation metrics for data classification evaluations	International Journal of Data Mining & Knowledge Management Process	M Hossin, MN Sulaiman	2015
730	121.67	The role of knowledge-oriented leadership in knowledge management practices and innovation	Journal of business research	MJ Donate, JDS de Pablo	2015
544	68.00	Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance	The International Journal of Advanced Manufacturing Technology	A Noruzy, VM Dalfard, B Azhdari	2013
515	64.38	Determinants of knowledge sharing in a public sector organization	Journal of knowledge management	AT Amayah	2013
495	61.88	Knowledge sharing amongst academics in UK universities	Journal of knowledge management	R Fullwood, J Rowley, R Delbridge	2013
487	60.88	Knowledge management and innovation performance in a high-tech SMEs industry	International Small Business Journal	J Alegre, K Sengupta	2013
408	58.29	Motivating knowledge sharing in knowledge management systems: A quasi–field experiment	Journal of Management	S Wang, RA Noe, ZM Wang	2014
402	67.00	Defining knowledge management: Toward an applied compendium	Online Journal of Applied Knowledge Management	J Girard, J Girard	2015
400	57.14	Knowledge management and organizational performance in the service industry: The role of transformational leadership beyond the effects of transactional	Journal of business research	M Birasnav	2014
396	66.00	Project success analysis framework: A knowledge-based approach in project management	International Journal of Project Management	ML Todorović, DČ Petrović, MM Mihić	2015

The highest and average number of citations per year in scientific journal publications is dominated by time span 2013-2015 as shown in Figure 3. The number of citations is 742 and average publication per year is 123.67 which is main rank in obtaining citations based on each publication period. From the pattern for the number of citations obtained, it can be seen that to get a large number of citations it takes minimum span of five years to be known by academics and researchers. Various sources of different journals from several publishers who have good quality articles are able to get high number of citations. For this reason, it is necessary to write a journal with the best quality, one of which is by raising topics that have novel value and have not been widely researched.

Table 4

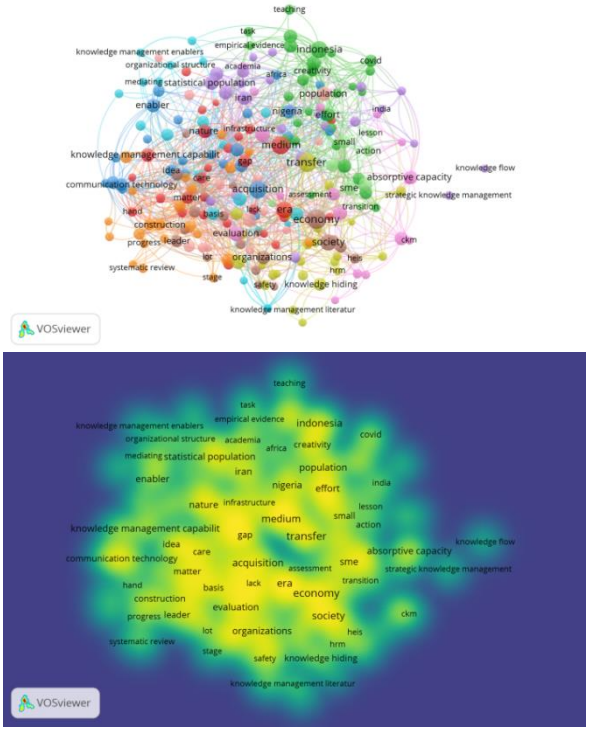
Ranked in the top ten scientific journal publications 2013-2020

Rank	Authors	Title	Source Journal	Publisher	Year	TC	APY

1	BY Obeidat, RH Al-Dmour, A Tarhini	Knowledge management strategies as intermediary variables between business strategic alignment and firm performance	European Scientific Journal	European Scientific Institute	2015	65	10.83
2	S Wang, RA Noe, ZM Wang	Motivating knowledge sharing in knowledge management systems: A quasi–field experiment	Journal of Management	Sage	2014	408	58.29
3	MA Islam, NK Agarwal, M Ikeda	Effect of knowledge management on service innovation in academic libraries	IFLA journal	Sage	2017	45	11.25
4	J Wu, B Guo, Y Shi	Customer knowledge management and IT-enabled business model innovation: A conceptual framework and a case study from China	European management journal	Elsevier	2013	179	22.38
5	MJ Donate, JDS de Pablo	The role of knowledge-oriented leadership in knowledge management practices and innovation	Journal of business research	Elsevier	2015	730	121.67
6	M Shujahat, MJ Sousa, S Hussain, F Nawaz	Translating the impact of knowledge management processes into knowledge-based innovation: The neglected and mediating role of knowledge-worker productivity	Journal of business research	Elsevier	2019	227	113.50
7	M Del Giudice, V Maggioni	Managerial practices and operative directions of knowledge management within inter-firm networks: a global view	Journal of Knowledge Management	Emerald	2014	319	45.57
8	J Alegre, K Sengupta	Knowledge management and innovation performance in a high-tech SMEs industry	International Small Business Journal	Sage	2013	487	60.88
9	S Wang, RA Noe, ZM Wang	Motivating knowledge sharing in knowledge management systems: A quasi–field experiment	Journal of Management	Emerald	2014	408	48.50
10	AYK Chua, S Banerjee	Customer knowledge management via social media: the case of Starbucks	Journal of Knowledge Management	Emerald	2013	360	45.00

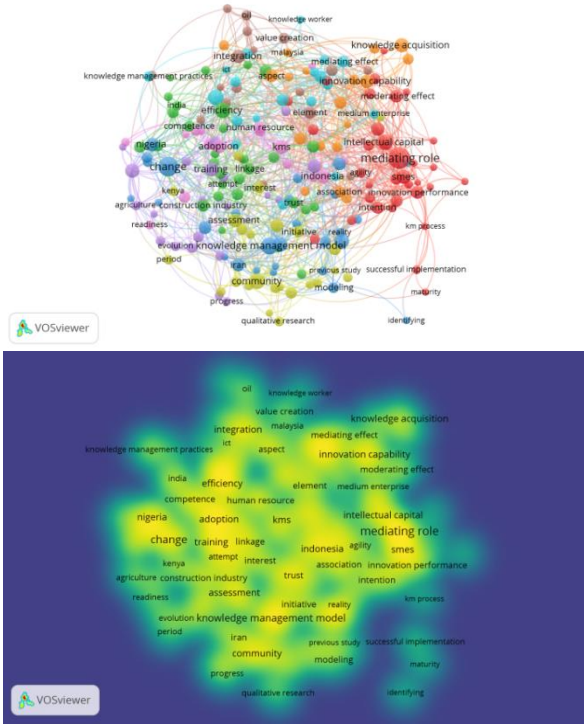
Table 4 shows the ranking of top ten titles for scientific journals that have been published in various publishers with the best writing quality on the concept of knowledge management. Nine best paper titles are indicated to have Scopus index and use globally known publishers such as Elsevier, Emerald, and Sage publications. The paper, which was ranked first with the title knowledge management strategies as intermediary variables between business strategic alignment and firm performance, was not indexed by Scopus but had a high novelty value. For this reason, papers published in scientific journals do not have to be indexed by Scopus to get the best ranking but must contain material that has specificity and novelty.

Figure 1. Network visualization and density in 2020



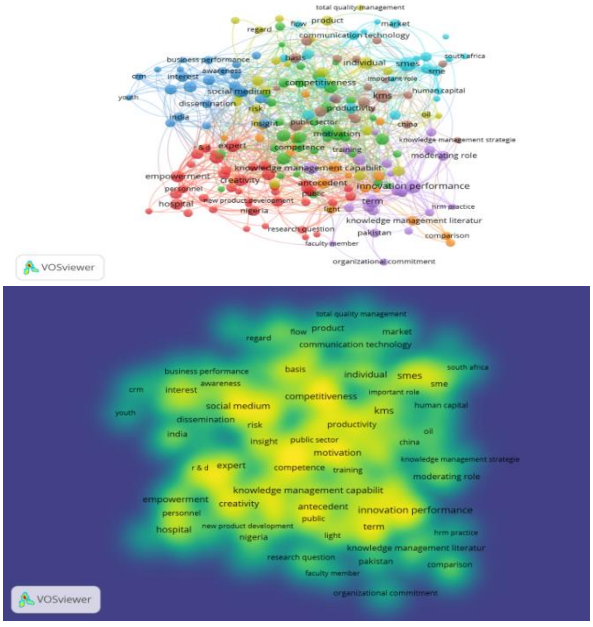
The linkages between nodes through connectivity, which illustrates the position of research topic, are shown in network and density visualization model in Figure 1. Nodes that represent research topics in certain colors are in the same cluster if they have similar colors. The existence of many color nodes, it is known that the network visualization displayed has clusters according to the number of existing node colors. The linkage between nodes shows that the research topic has a relationship and is interrelated between them. The size of node shows the frequency of research topics published in scientific journals, more often the topic is published, larger the node size. In addition, the brightness of color displayed on density visualization shows that analyzed topic has been widely researched and published in scientific journals. Research topics that have relatively large node sizes and have the brightest colors that have large publication frequency on the concept of knowledge management include economy, acquisition, society, organization, and medium. Meanwhile, several other topics that have not been widely published and still need to be researched for knowledge development include strategic knowledge management, knowledge flow, knowledge management literature, and knowledge management capability. Some topics that have not been widely published in results of the analysis have a great opportunity to be followed up in further research as part of scientific evolution for the development of knowledge.

Figure 2. Network visualization and density in 2019



Scientific journal publications in 2019 on the concept of knowledge management seem to have many clusters based on the color shown on the nodes. Several research topics analyzed and widely published in this time span refer to scientific evolution including mediating roles, intellectual capital, knowledge acquisition, community, change, and knowledge management models. Meanwhile, several topics that need to be researched and developed in further research include knowledge workers, knowledge management practices, knowledge management processes, and value creation.

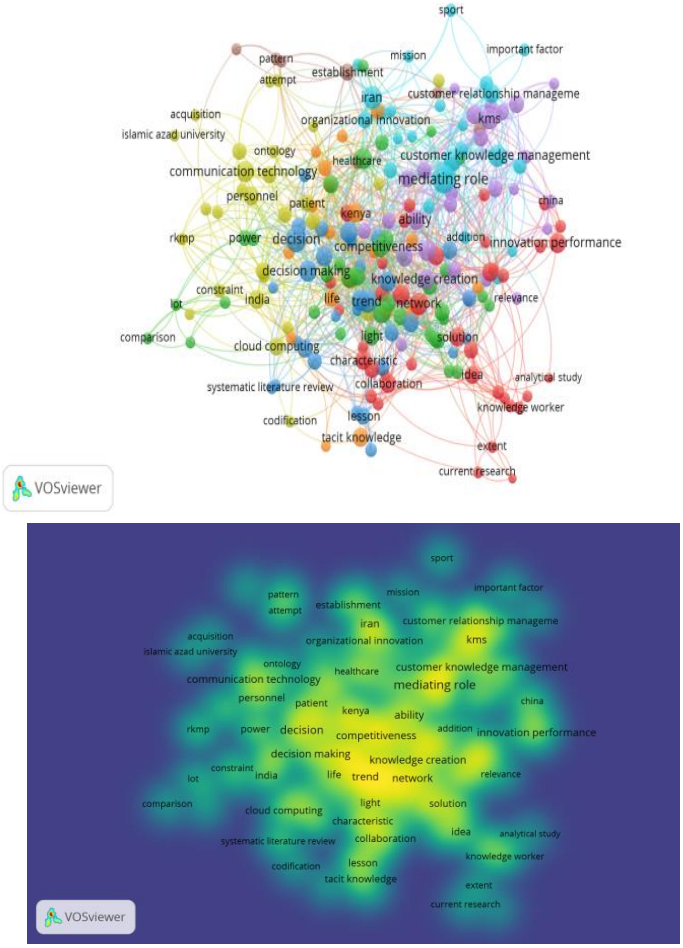
Figure 3. Network visualization and density in 2018



Innovation performance, motivation, productivity, small medium enterprises, and competitiveness are topics that have larger node sizes and brightness levels than others, which mean that they have been published in various scientific journals. Strategic

knowledge management, knowledge management literature, human capital, and total quality management appear to have node sizes and low brightness levels so that they have opportunity to investigate further which are expected to have novelty for the development of knowledge on the concept of knowledge management.

Figure 4. Network visualization and density in 2017



Knowledge development carried out through scientific evolution in network visualization and density 2017 on the concept of knowledge management has several topics that have novelty including knowledge workers, tacit knowledge, codification, and customer relationship management. Furthermore, several research topics that are trending include knowledge creation, competitiveness, decision making, knowledge management systems, and communication technology. Furthermore, several research topics that are trending include knowledge creation, competitiveness, decision making, knowledge management systems, and communication technology. The research topics found from the analysis are part of a scientific evolution that is important to follow up as a knowledge development effort in supporting the strengthening of human resources, especially in uncertain situations and conditions.

Figure 5. The results of the word cloud analysis on the concept of knowledge management

To complement the novelty of topics presented in this study, word cloud is added which often arises from word analysis in scientific journals that have been published, especially on the concept of knowledge management. Figure 5 shows that knowledge management, management, and knowledge are the words that have the largest and most prominent dimensions and sizes compared to other topics because they are the words that appear the most in scientific journal publications. In addition, several other words that are quite widely quoted in various scientific journal publications that are displayed in the results of word cloud analysis include capital, acquisition, innovation, capital value, organization mediating, competitive communication, sustainable development, management capability, enterprise competitiveness, tacit knowledge, and capital knowledge.

Conclusion

Human capital development through various efforts in developing diversity of knowledge management is an important part in strengthening human resource development in order to face global conditions that experience turbulence and unpredictability. Expansion for the concept of knowledge management needs to be investigated further for topic development through scientific evolution as an effort to improve the quality of knowledge in supporting the development of human resources. The research output states that results for the analysis of knowledge development concept published in various scientific journals in 2013-2020 period obtained new topics and have novelties that are recommended for further development, including strategic knowledge management, knowledge flow, knowledge management literature, knowledge management capability, knowledge workers, knowledge management practices, knowledge management processes, human capital and value creation. Knowledge development shows positive trend in line with the development of human resources owned by organizations that should be able to optimally contribute to strengthening human development. Network visualization and density in developing the concept of knowledge development are characterized by the existence of interrelationships between topics tested and presented in interactive and interesting way. The novelty of topic is displayed through the resulting visualization referring to dominance, color and size of nodes and interrelationships between them. To get significant number of citations, what must be done is how to make manuscripts that have good quality that have novelty value and can be published in reputable journals and publishers so that they can be quickly spread and recognized by academics and researchers.

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