BIBLIOMETRIC ANALYSIS OF NETWORK GOVERNANCE IN PUBLIC SERVICES

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Article Info	
Keyword: Bibliometrix; Network Governance; *Public service.*	**Abstract:** *Enthusiasm for Network Governance theory has increased in recent years. Then, how is the development of the application of network governance theory in public services? This study aims to provide an understanding of network governance theory in public services through a bibliometric analysis of the development of related studies over the last 10 years. The bibliometric analysis in this study utilized the Web of Science journal database which was visualized using the VosViewer and R Biblioshiny applications to analyze 332 published journals on network governance and public services. Based on the analysis that has been done, one of the studies with the most citations found that this theory is relevant in responding to public needs. Much research related to network governance in public services has been carried out in the United States. Based on biblioshiny analysis, several journal sources that are most relevant to this research topic in the Public Administration research area include the Public Management Review, American Review of Public Administration, International Journal of Public Sector Management, International Review of Administration Science, and Journal of Public Administration.*
Keywords: *Bibliometrics;* *Network Governance;* *Public service.*	**Abstract:** *Enthusiasm for Network Governance theory has increased in recent years. Then, how is the development of the implementation of network governance theory in public services? This study aims to provide an understanding of network governance theory in public services through bibliometric analysis of the development of related research over the last 10 years. Bibliometric analysis in this study utilizes Web of Science journal data visualized using VosViewer and R Biblioshiny applications to analyze 332 journal publications on network governance and public services. Based on the analysis that has been done, one of the studies with the most citations found that this theory is relevant in answering public needs. Research related to network governance in public services is mostly produced by the United States. Based on biblioshin analysis, some of the journal sources that are most relevant to this research topic in the Public Administration research area include Public Management Review, American Review of Public Administration, International Journal of Public Sector Management, International Review of Administrative Science, and Journal of Public Administration Research and Theory.*

INTRODUCTION

The world today is experiencing very rapid development. Developments between sectors create an interconnected world ecosystem. One of these developments also occurred in the governance sector. Increasingly complex public problems, increased effectiveness and efficiency, limited resources, and different interests require the government to present a more flexible and relevant governance in this era. The theory of government network governance or commonly referred to as *'network governance theory'* emerged as one of the answers to existing demands. This theory involves a network of actors and organizations in governance to realize better governance. Based on data presented on the *web of science* platform, the number of studies on this theory continues to increase. This indicates an increasing development and enthusiasm about this theory so that it can be concluded that this theory plays an active role in supporting the creation of better governance.

Network governance according to Klijn and Koppenjan (2016) is defined as a process of social coordination in collaboration between government, business, and civil society in an effort to overcome public problems. Much of the past research on *network governance* has focused on meaning development and theoretical practice. As an article written by Pirson and Turnbull (2011) entitled *'Toward a More Humanistic Government Model: Network Governance Structure'* argues that *network governance* is a more humanistic alternative paradigm oriented to networks in governance structures. Research entitled *'Toward Network Governance: Educational Reforms and Governance Changes in China (1985-2020)' by Tao (2020)* presents a deeper understanding of the *theory and practice of* network governance supported by case studies of its practice in China that can contribute to mapping the global network landscape of governance. Research conducted by Klijn and Koppenjan (2012) entitled *'Governance Network Theory: Past, Present, and Future'* contributes to the meaning of *network governance* theory itself to prevent the loss of *explanatory power* theory because it is realized that this theory is a theory that can answer various challenges that occur. Another study conducted by Jacobson (2015) entitled *'How and Why Network Governance Evolves: Evidence from Public Safety Netwok'* also helps us to understand the meaning of *network* governance by exploring the evolution of governance related to public sector networks over more than 40 years. Another research that also contributes to this theory is a research conducted by Davies (2012) entitled *'Network Governance Theory: A Gramscian Critique'* which tries to develop a Gramscian critique of network flows that exist today, where based on this research it can be concluded that *network governance* theory is a concept that offers a way to overcome the dualism of government for government.

Based on existing research, it can be seen that this theory continues to develop in its meaning and become one of the answers to the question of how to realize good and efficient governance. The question now is how is the development of the implementation of *network governance* theory in public services? Thus, this study aims to provide an understanding of *network governance* theory in public services through bibliometric analysis in related studies over the last 10 years seeing the absence of bibilometric research on this discipline. Biclometrics is an application with a statistical and mathematical basis in communication media that includes various written works (Pritchard, 1969 in Glanzel, 2003). This research involves librarians as indicators in the development of bibliometric methods. This method allows for regional, national, institutional, and comparable evaluation of science. It is hoped that the results of this research can be useful for the development of science, especially related to *network governance* in the future.

Bibliometric analysis is an analytical activity of scientific studies that contributes to the development of knowledge about a research topic researched by researchers (Tupan, et al., 2018). Bibliometric research provides benefits for various parties, including scientists, industry practitioners or policy makers, as well as the general public (Purnomo, 2019). Researchers will be facilitated by this type of research because they will know what research topics have not, have been, or are trending to be researched so that this can be used as a reference to study a field. For industry practitioners or policy makers, this research is useful to see trends and/or growth patterns that society has. As for the community, policies or products issued by policy makers or industry practitioners can be more in line with what the community needs.

This article contains 6 parts starting from the introduction which contains background on this research. The second part will describe previous research on *network governance*, public services, and bibliometric analysis. The third part will discuss the systematics of data collection and processing in this study. The fourth part will discuss the results of research that contains data visualization based on categories and results from the VOSviewer platform as an analysis tool. The fifth section will discuss the most popular networks and research on this topic. Then, the sixth part contains the conclusions of the research conducted.
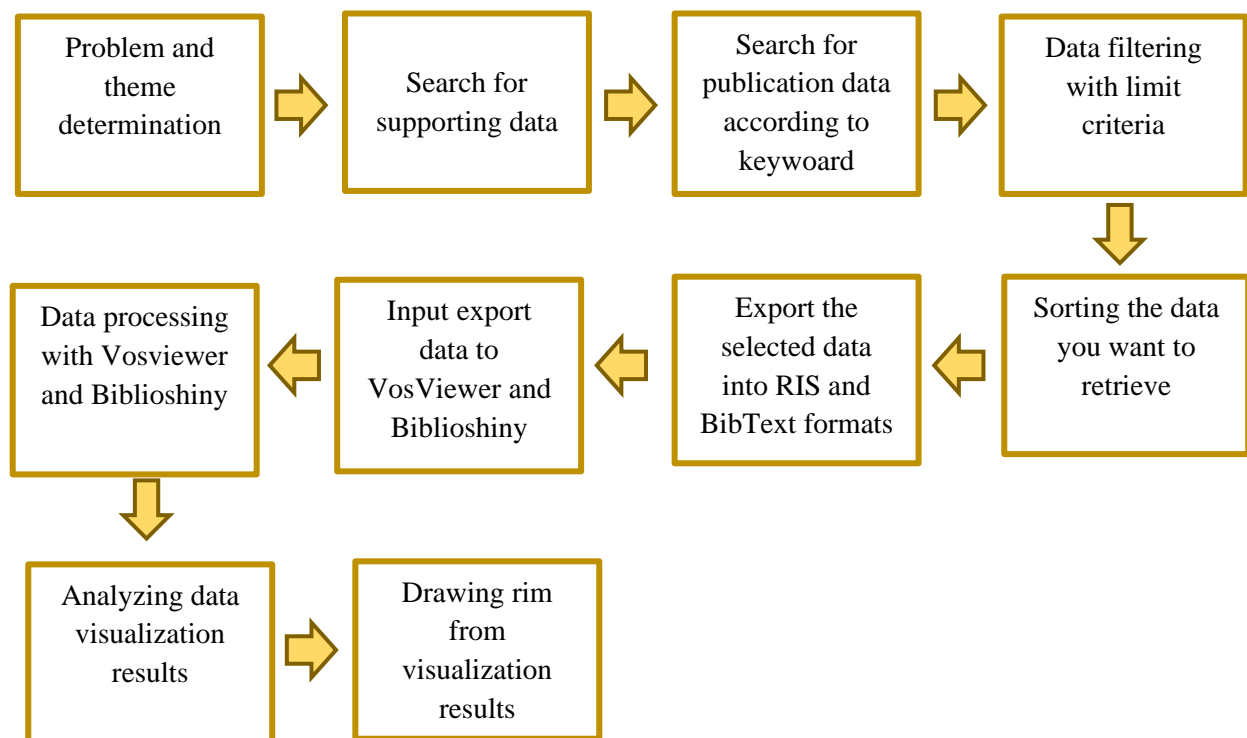
RESEARCH METHOD

Figure 1. Research Method Flowchart

Figure 1 is a research method flowchart that contains an explanation of the process of determining research problems and themes, taking data from databases, data processing, to drawing conclusions from the results provided by research analysis tools. This research takes a topic with strong relevance to the field of public administration studies, namely *network governance theory*. The theory was chosen because it is in accordance with the current situation, where *network governance theory* emphasizes collaboration, partnership, and network relationships between actors to create good governance through policy success. This theory is

then connected with the concept of ' *public service*' or public service, which intends to see the development of the implementation of *network governance* theory in public services. This study used a bibliometric approach to analyze the data that had been obtained. The bibliometric analysis approach will help the development of this theory (Tupan, et al., 2018) through identifying the relationship between one journal and another. Data search is done through *the Web of Science* database or can be accessed through www.webofscience.com. *Web of science* is a research database that provides access to various scientific literature grouped by index and based on the research theme taken. The database includes more than 21,000 journals, conference proceedings, and other surmber. Managed by Clarivate Analytics, the *web of science* allows its users to track the impact of research and identify the impact of the work on the field under study. Data search using the keywords *network governance* and *public service*. Data that has been selected or adjusted to the needs is then processed through the VOSViewer and Biblioshiny applications. *Visualization of Similarities* or commonly known as VosViewer is a computer program that is useful for providing visualization and exploration of bibliometric knowledge maps (Leydesdorff &; Rafols, 2012). The visualization results in the form of colored clusters obtained from a parameter and can be propagated or vice versa (Leydesdorff &; Rafols, 2012). This program has a *text mining* feature that is useful for identifying relevant word cities and later mapped through *a clustering approach* to find out the relationship between *co-citation and* co-occurrence data (Van Eck &; Waltman, 2010). In addition, the program facilitates accessing and exploring bibliometric data networks through available interactive options and functions (Van Eck & Waltman, 2010). Analysis is then carried out based on the results of the visualization provided by the application followed by drawing conclusions.
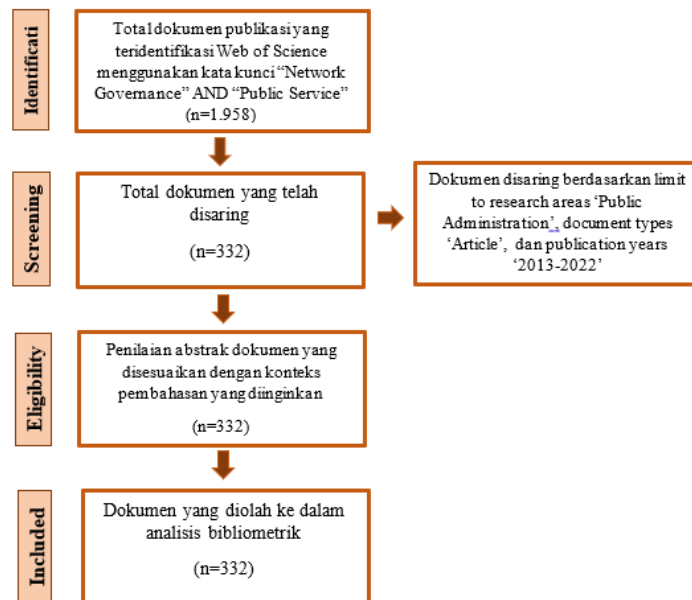

Figure 2. PRISMA Flowchart for Bibliometric Analysis

Based on Figure 2, the data search process was carried out using the keywords *'network governance'* and *'public service'* with the search results of 1,958 documents. From the initial search results presented, the results are filtered by providing limits on the *research area*, namely

'Limit to Public Administration' and year limits, namely from 2013 to 2022 (the last 10 years). This is to provide specifications that this research is a research in the field of public administration studies and to see trends in the use of *network governance* theory in public services in the last 10 years. In addition, restrictions are also applied to document *types*, namely 'Limit to Article'. This screening obtained the results of 332 documents which were further filtered based on the feasibility value and suitability of this study through reading the abstract of the document. This abstract assessment produces data as many as 332 documents that are worthy of being processed into the next stage. Documents that have been assessed and selected are then *exported* in the form of RIS and BibText. Document processing is then done using VOSViewer and Biblioshiny applications.

RESULT AND DICUSSION

By Year of Publication

Table 1. Publication trends related to *network governance* in public services in 2013-2022

Year	Document	Presented
2022	32	9,639%
2021	43	12,952%
2020	30	9,036%
2019	52	15,663%
2018	32	9,639%
2017	45	13,554%
2016	34	10,241%
2015	18	5,422%
2014	24	7,229%
2013	22	6,627%
Sum	332	100%

Source: Web of Science, 2023

Based on the search results of scientific publications related to the keywords *'network governance'* and *'public service'* during the period 2013-2022, 316 documents were obtained. The most publications were in 2019, which was 52 publications. While the lowest publication was in 2015, which was 18 publications. Based on table 1, it can be seen that research on *'network governance'* and *'public service'* in the category of public administration research tends to increase with details of the number of publications per year, as follows: in 2013 as many as 22 publications, 24 publications in 2014, 18 publications in 2015, 34 publications in 2016, 45 publications in 2017, 32 publications in 2018, 52 publications in 2019, 30 publications in 2020, 43 publications in 2021, and 32 publications in 2022.

By Author Name

Figure 3. Growth of publications related to network governance in public services based on author name
Source: Web of Science, 2023

Figure 3 presents the 10 authors with the most publications due to the large number of authors in this field. Author Trivellato B produced 5 publication documents and is the author with the most publications on *network governance* in public services for the last 10 years in the area of public administration research. The second author with the most published documents is Cristofoli D, Guameros-meza V, and Torfing J with a total of 4 publication documents. Next in third position, with the number of publications as many as 3 documents won by Carey G, Chen YC, Dixon R, Fyall R, Gerlak AK, and Lee J.

Based on Journal Sources

The basis of journal sources in this study uses categories or research areas in the field of public administration related to *network governance* in public services during the last 10 years or from 2013 to 2022. Based on the journal category sources, 332 relevant journals were found to be researched in this bibliometric research.
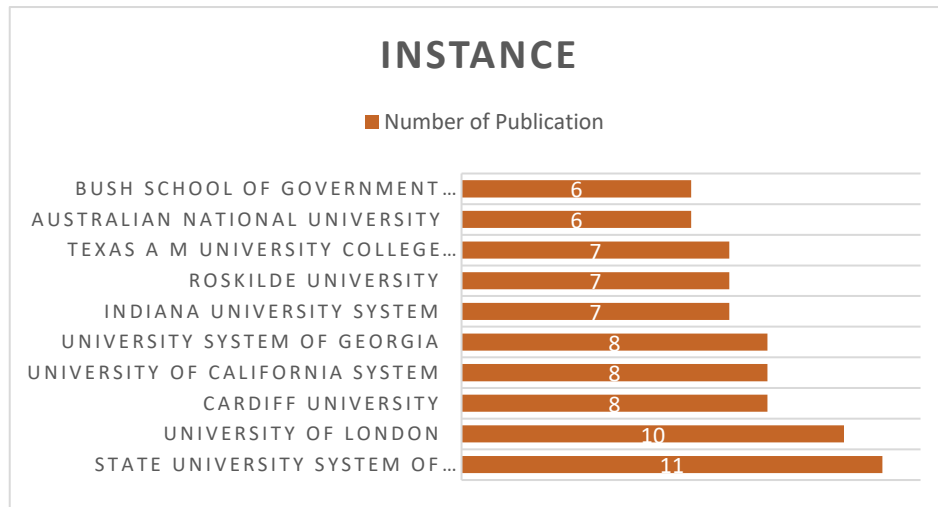
By Agency

INSTANCE

■ Number of Publication

Agency	Number of Publication
BUSH SCHOOL OF GOVERNMENT…	6
AUSTRALIAN NATIONAL UNIVERSITY	6
TEXAS A M UNIVERSITY COLLEGE…	7
ROSKILDE UNIVERSITY	7
INDIANA UNIVERSITY SYSTEM	7
UNIVERSITY SYSTEM OF GEORGIA	8
UNIVERSITY OF CALIFORNIA SYSTEM	8
CARDIFF UNIVERSITY	8
UNIVERSITY OF LONDON	10
STATE UNIVERSITY SYSTEM OF…	11

Figure 4. Growth of publications related to network governance in public services by agency
Source: Web of Science, 2023

The data presented in gamber 4 is taken based on the top 10 agencies with the most publications. Based on figure 4, the agency that contributed the most publications in the topic of *network governance* research on public services in the area of public administration research over the past ten years was the State University System of Florida with 11 research documents. Then followed by the University of London with the results of the publication of 10 research documents. Then the third position was won by Cardiff University, University of California System, and University System of Georgia with a total of 8 publications and many other institutions.
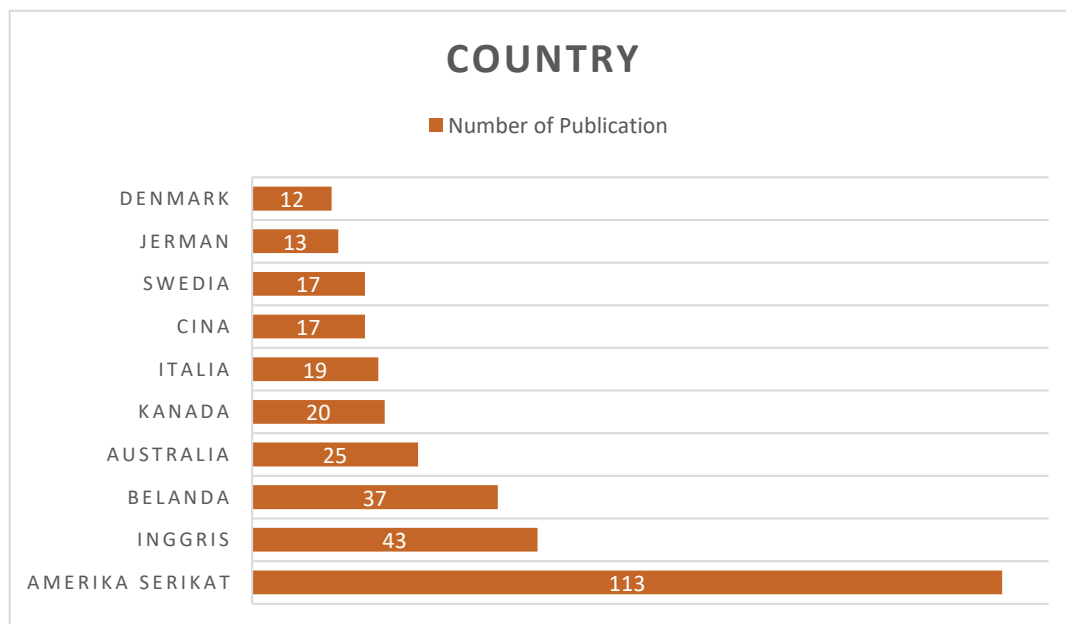
By Country

COUNTRY

■ Number of Publication

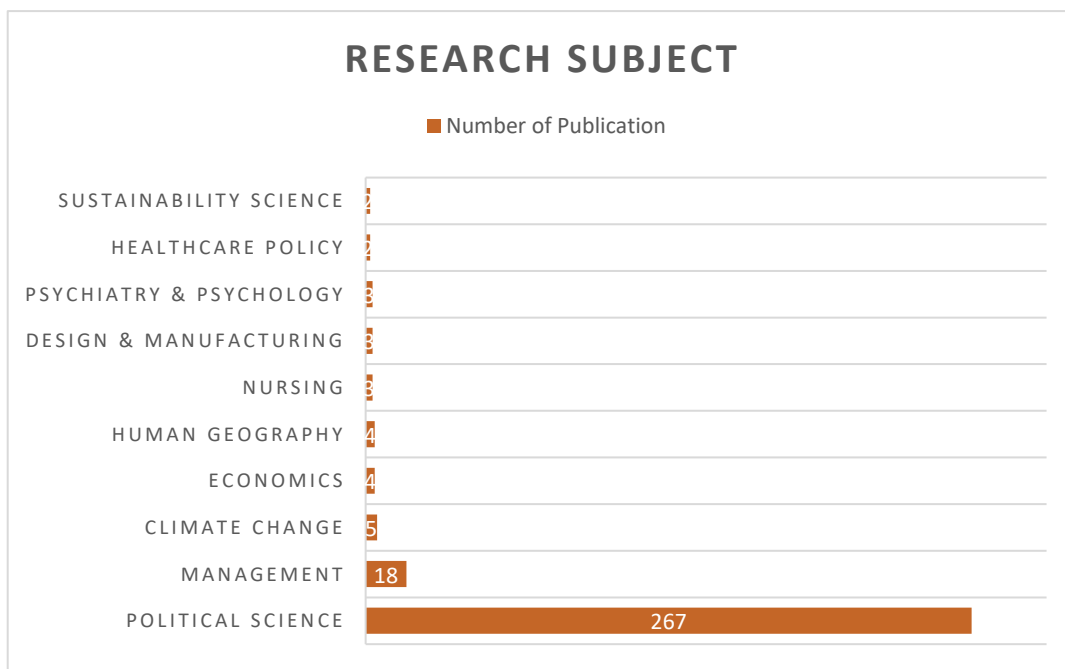| Country	Number of Publication
DENMARK	12
JERMAN	13
SWEDIA	17
CINA	17
ITALIA	19
KANADA	20
AUSTRALIA	25
BELANDA	37
INGGRIS	43
AMERIKA SERIKAT	113

Figure 5. Growth of publications related to network governance in public services by country
Source: Web of Science, 2023

Figure 5 is taken from the data of the top 10 countries with the most publications on this research topic in the last 10 years. Based on the figure 5 countries that do a lot of publications related to *network governance* in public services are the United States with 113 publications. The second position was achieved by the UK with 43 publications related to this topic. Then in the third position of the largest contributor to publications related to the topic of *network governance* research in public services for the last 10 years is the Netherlands, which is as many as 37 publications. Based on these data, it can be concluded that research on *network governance in* public services is studied in various parts of the world so that this indicates that the development of the application of this theory can be categorized as popular in various countries.

By Document Type

This study used a journal document type. Where there are 332 journals related to *network governance* research topics in public services over the past 10 years.

By Subject Field

Figure 6. Growth of publications related to network governance in public services by subject
Source: Web of Science, 2023

Of the 332 documents obtained from the search results, these documents were classified into various research subjects. Therefore, figure 6 presents 10 research subjects that often appear related to the publication of *network governance* in public services. The first position was achieved by the subject *of Political Science* with 267 publications because this research topic was widely studied related to government science or related to state administration. Furthermore, the second position was achieved by Management with many publications, 18 out of 332 publications obtained. Then for the third position achieved by the subject of *Climate Change* with 5 publications. There are various other subjects that are also related to this topic, especially

regarding its relevance to public services, including *Economics, Human Geography, Nursing, Design &; Manufacturing, Psychiatry &; Psychology, Healthcare Policy,* and *Sustainability Science.*

Visualization of Publications in Vosviewer Applications

Keyword Dissemination Map using *Network Visualization*

Data visualization through the VOSViewer application obtained 5704 keywords obtained. Visualization by VOSViewer is done on as many as 2053 links or many linkage relationships of keyword subjects. Based on the visualization carried out, 5 clusters of 79 related keyword items were found. The first cluster consists of 24 subject keywords. The second cluster consists of 18 subject keywords. The third cluster consists of 11 subject keywords. The fourth cluster consists of 12 keywords. While the fifth cluster consists of 5 keywords. There are three visualizations performed on the VOSViewer application. The first visualization is *'network visualization'* or network visualization that functions to describe the relationship of keywords contained in the processed data. The second visualization is '*overlay visualization'* which functions in describing data according to the year of publication of the journal. And the third visualization is *'density visualization'* which provides an overview of the density of research subjects related to the data processed.
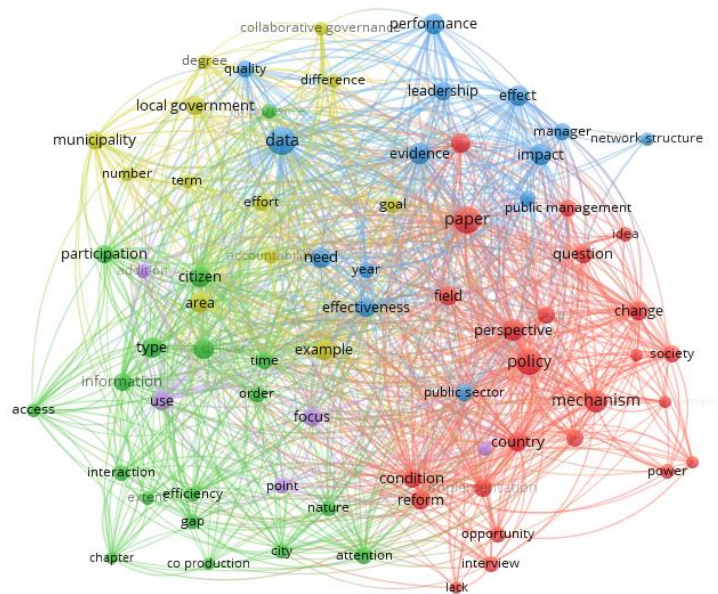

Figure 7. Visualization of bibliometric analysis related to *network governance* theory in public services on the VOSViewer application in 2013-2022 with *Network Visualization*
Source: VosViewer, 2023

Based on Figure 7 it can be seen that 5 clusters based on processing results are presented in different colors. In this study, the colors presented were red, green, blue, yellow, and purple. In each color, the largest circle indicates that the keyword was most used in studies taken as data. In the red color cluster the most frequently used keyword is 'paper', in green the most used keyword is '*citizen*', in red the most frequently used keyword is 'data', in yellow the most frequently used keyword *is 'area', and in purple the most used word* is 'use'.
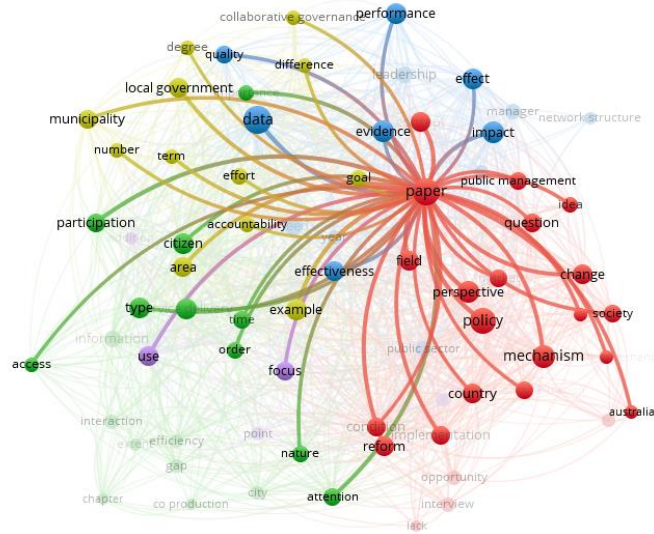
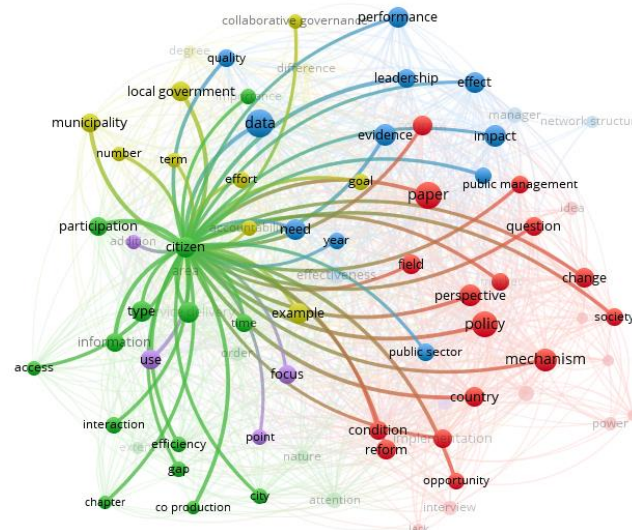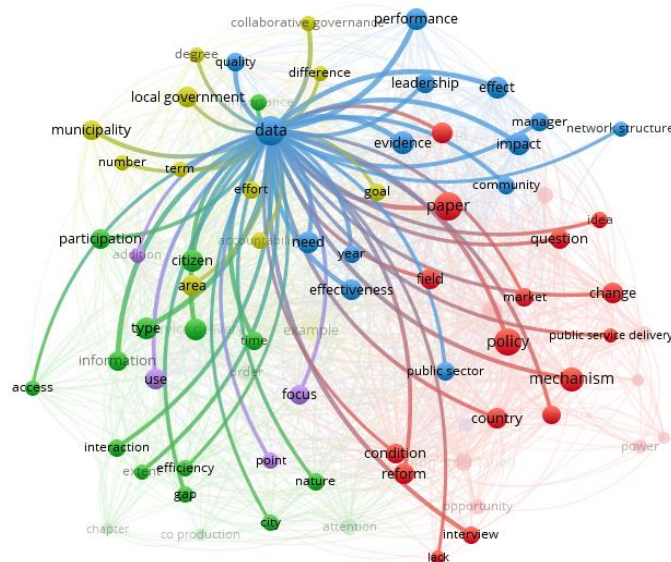**Figure 8.** Visualization of cluster 1 based on *network visualization* on the keyword distribution map
Source: VosViewer, 2023

Cluster 1 or red cluster is a cluster consisting of 24 items with the largest item being *paper* with 67 links, 248 relationship strengths, and 49 occurrences. The next largest item is *the policy* with 64 links, 238 relationship strengths, and 43 occurrences. Then followed by the word *mechanism* with 62 links, 200 relationship strengths, and 32 occurrences. In figure 8, it can be concluded that the theme of this cluster is related to the keywords *mechanism, policy, opportunity, public administration, public management,* and *reform in* network governance *research in* public services.

Figure 9. Cluster 2 visualization based on *network visualization* on keyword distribution map
Source: VosViewer, 2023

Cluster 2 or green cluster is a cluster consisting of 18 items with the largest item being *citizen* consisting of 66 links, 192 relationship strengths, and 28 occurrences. Followed by the word *service delivery* which consists of 66 links, 186 relationship strengths, and 26 occurrences. As well as the word *participation* with 59 links, 158 relationship strengths, and 22 occurrences. Based on figure 9, this cluster theme in this cluster is relevant to keywords such as *service delivery, participation, interaction, gap,* and *citizen* in *network governance* research on public services.

Figure 10. Visualization of cluster 3 based on *network visualization* on the keyword distribution map
Source: VosViewer, 2023

Cluster 3 or blue cluter is a cluster with 14 items. The largest item is held by *data* that has 68 links, 305 relationship strengths, and 52 occurrences. The next item is *evidence* which consists of 67 links, 196 relationship strengths, and 31 occurrences. Then the third position item is the *impact item* with 64 links, 162 relationship strengths, and 30 occurrences. Based on figure 10, the theme in cluster 3 has relevance to keywords such as *evidence, impact, effectiveness, leadership,* and *community* in network *governance research* on public services.
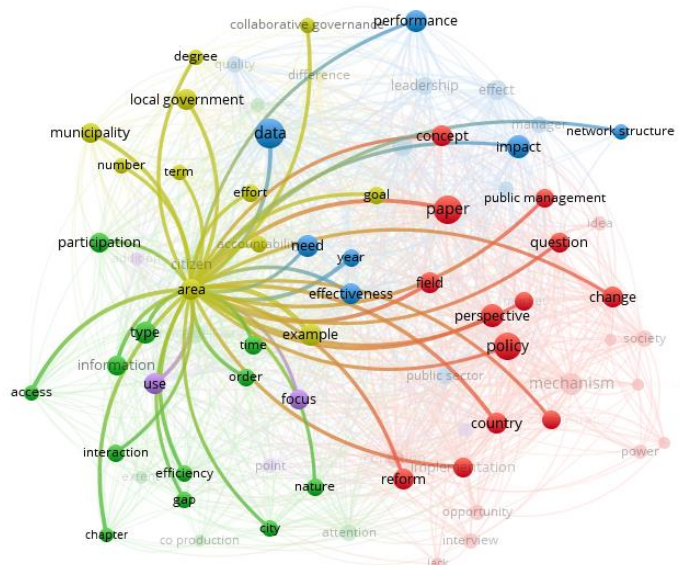
Figure 11. Visualization of cluster 4 based on *network visualization* on the keyword distribution map

Source: VosViewer, 2023

Cluster 4 or yellow cluter is a cluster with 12 items. The largest item is held by *an area* that has 67 links, 159 relationship strengths, and 25 occurrences. The next item is *municipality* which consists of 57 links, 138 relationship strengths, and 22 occurrences. Then the third position item is the *local government item* with 53 links, 117 relationship strengths, and 24 occurrences. Based on figure 11, the theme in cluster 4 has relevance to keywords such as *area, municipality, local government,* and *collaborative* governance in *network governance* research on public services.
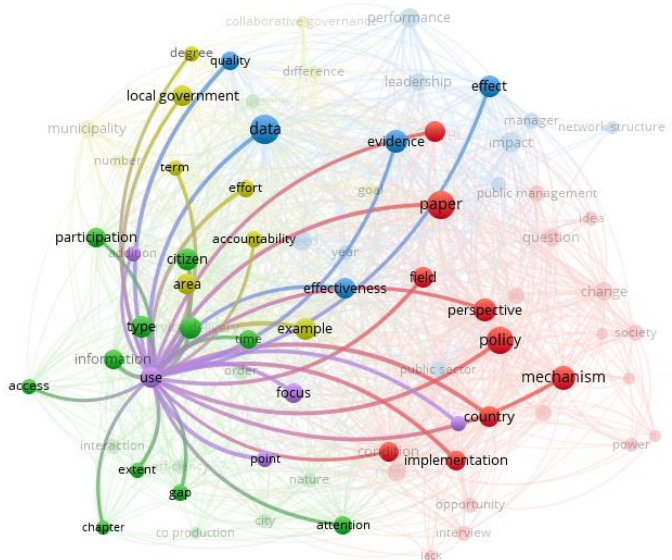

Figure 12. Visualization of cluster 5 based on *network visualization* on the keyword distribution map

Source: VosViewer, 2023

Cluster 5 or purple cluter is a cluster with 5 items. The largest item is held by *use* which has 66 links, 171 relationship strengths, and 23 occurrences. The next item is *focus* which consists of 37 links, 142 relationship strengths, and 21 occurrences. Then the third position item is the *point item* with 56 links, 117 relationship strengths, and 15 occurrences. Based on figure 12, the theme in cluster 5 has relevance to several keywords which include *addition, focus, point, practitioner,* and *use* in *network governance* research on public services.

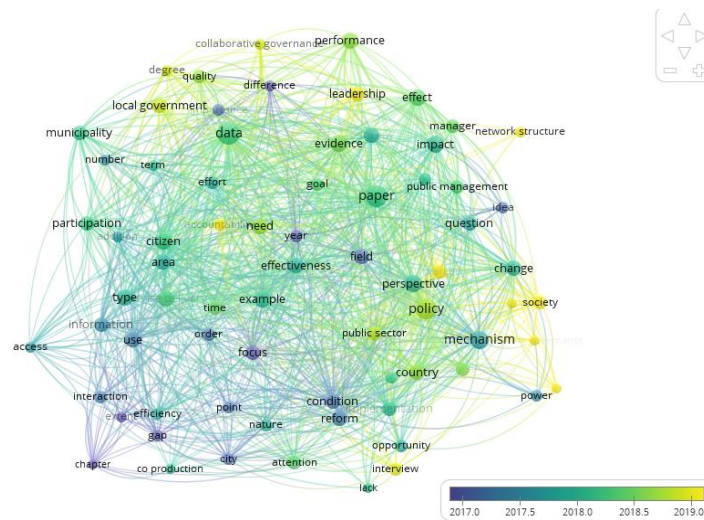**Kuunci Word Dissemination Map using *Overlay Visualization***

Figure 13. Visualization using bibliometric analysis related to *network governance* theory in public services on the VOSViewer application in 2013-2022 with *Overlay Visualization*
Source: VosViewer, 2023

The data analyzed in this study is published data for 2013-2022. The darker the color of the circle in the *overlay* visualization, indicating that the study is the earliest study of the time period specified in this study, which is the year equal to or close to 2013. It can be seen in the picture 13 keywords included in the longest research are the subject words *difference, field,* and *idea*. If the color of the circle is getting brighter, it indicates that the study is a recent study or is the latest research, which is equal to or close to 2023. Based on the images presented, the latest research is on the subject words *society, network structure* and *accountability*.

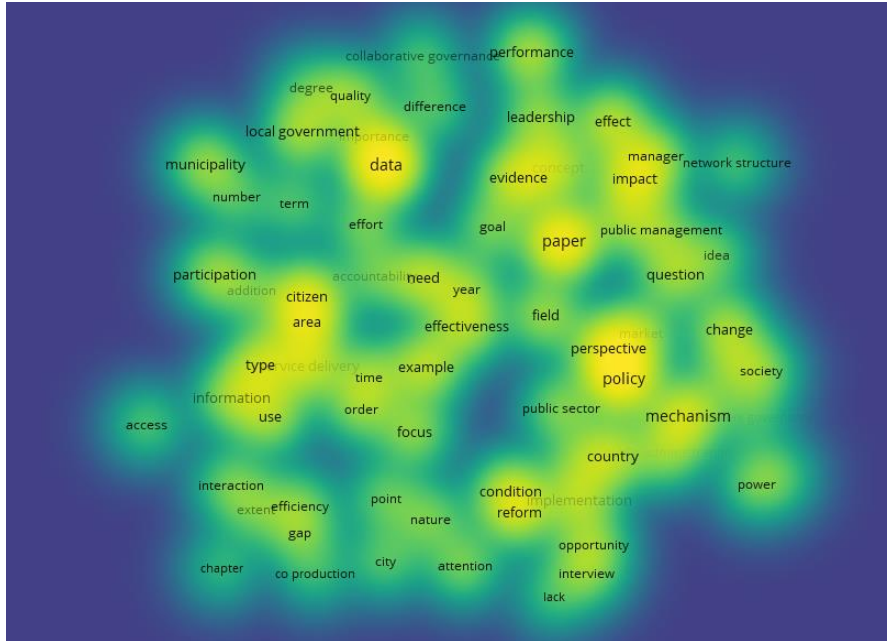**Keyword Dissemination Map using *Density Visualization***

Figure 14. Visualization using bibliometric analysis related to *network governance* theory in public services on the VOSViewer application in 2013-2022 with *Density Visualization*
Source: VosViewer, 2023

The visualization presented in *this density visualization* shows that the brighter the color, indicating that more research is done related to the word. The dark blue presented in the image is termed 'region' and further away from lighter colours means that research on the word has not been studied much. For example, the keywords *perspective, policy, data,* and *citizen* are keywords that have been widely studied because they have the brightest colors. While the keywords *access, term,* and *co production* are in areas that tend to be darker, indicating that not many have researched these keywords.

Publication using R Application (*Biblioshiny)*
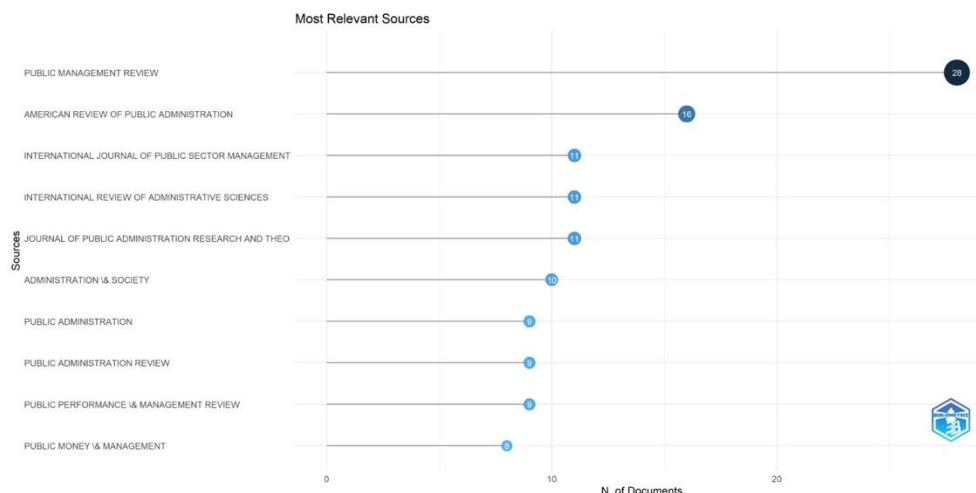
Based on the most Relevant Journal

Figure 15. Visualization of the Relevance of Journal Sources related to *network governance* theory in public services in 2013-2022 through the R application

Based on figure 15, the visualization obtained from the R application based *on the keyword 'network governance' is related to journals that have strong relevance in research publications on* network governance in public services. In the Public Administration research area, *the journal that has the most publications related to the theme* of network governance *in public services is* Public Management Review with a total of 28 publications. The second position was achieved by the *American Review of Public Administration* with a total of 16 documents. The third position was achieved by *the International Journal of Public Sector Management, International Review of Administrative Science, and Journal* of Public Administration Research and Theory *with each publication of 11 documents.*

Based on the results of searching documents on *the Web of Science* related to the keywords *network governance* and *public service*, the author with the most document publications was Benedetta Trivellato with 5 publication documents. One of the published documents is a journal entitled *Network Management as a Contingent Activity. A Configurational Analysis of Managerial Behaviors in Different Network Settings*. This journal discusses the need for decision making combined with certain network characteristics such as network development, connectivity, and trust in an organization. The journal found that four different combinations of network activity and characteristics resulted in better network performance. Thus, this journal contributes to providing empirical insight into the combination of liaison activities and network characteristics that can have a good impact on organizational performance. In this case, the connecting activity is divided into three, namely stabilizing, bridging, and networking (Cristofoli, D., Trivellato, B., &; Verzillo, S., 2019). The journal was published in 2019 with 14 citations.

While the highest number of citations was achieved by Jesse D. Lecy, Ines A. Mergel, and Hans Peter Schmitz, namely 101 citations from his journal entitled *Network in Public Administration: Current Scholarship in Review* published in 2014. The journal contains the use of networks in the subdomains of policy making, governance, and policy implementation. The study found that there are different approaches to defining the role of networks and relationships between actors. Where based on social network analysis and conditions show that the network managed to provide better results (Jesse D. Lecy, Ines A. Mergel &; Hans Peter Schmitz, 2014).

The country that contributes the most articles related to *network governance* in public services is the United States with 113 publication documents. Based on this, we can know that the United States is one of the countries that is very active in developing research on this theory, especially in relation to its implementation in public services. One of the articles published from this country is an article titled *Professional Friendship, Resource Competition, and Collaboration in a Homeless Service Delivery Network* by Qian Hu, Kun Huang, and Bin Chen in 2019. This article highlights the influence of informal relationships or bonds in reducing the negative impact of collaboration. This journal departs from the realization that the provision of existing services is very focused on collaboration. In this case, it can be seen that collaboration provides a forum for service providers to meet public needs or demands through collaborative measures. However, collaboration does not always have a positive impact on stakeholders. Efforts to fulfill various interests or demands of the community can have an impact on the emergence of competition for resources that can damage collaboration. In this case, there is a phenomenon that shows that professional friendship relationships play a role in reducing the negative impact of collaboration competition. Based on the research conducted, the authors found that evidence of coexistence of interorganizational collaboration in substantive areas and competition for financial resources among homeless service providers. The study continued by examining whether there are

mechanisms that can be done to reduce these effects. Professional friendships can facilitate collaboration and moderate the negative impact of competition on collaboration. Thus, this study plays a role in seeing the relationship between professional friendship and competition and collaboration in public service delivery networks (Hu, Qian, Huang, K., &; Chen, B., 2020).

Another article published from the United States is the journal Informal *Accountability in Multisector Service Delivery Collaboration* by Barbara Romzek, Kelly LeRoux, Jocelyn Johnston, Robin J. Kempf , Jaclyn Schede Piatak in 2013. The journal explores the interpersonal interactions that occur in collaborative systems, between subsystems, and between organizations. This journal focuses on the influence of informal mechanisms that can facilitate collaboration, co-production, coordination, and integration of service delivery in a sustainable manner. In this study, the combination of bonds established both vertically and horizontally revealed the existence of shared norms, facilitative behavior, rewards and sanctions, and informal accountability dynamics. Informal accountability is shaped by relationship and behavior building, tensions in the operation of accountability systems, collaboration gaps with the reality of collaborative service provision, differences in service delivery across hierarchical level informals, and the important role of street-level bureaucrats (Romzek, B., LeRoux, K., Johnston, J., Kempf, R. J., &; Piatak, J. S, 2013).

CONCLUSION

Bibliometric analysis with VosViewer visualization in this study found 5 clusters of 73 related keyword items. The first cluster is a cluster consisting of 24 keyword items. The second cluster consists of 18 keyword items. The third cluster consists of 14 keyword items. The fourth cluster consists of 12 keyword items. While the fifth cluster consists of 5 keyword items. Based on the number of citations, the authors with the most citations were Jesse D. Lecy, Ines A. Mergel, and Hans Peter Schmitz with 101 citations in their journal written in 2014 under the title *Network in Public Administration: Current Scholarship in Review*. The results of the analysis also show that the number of publications on this research topic has increased from year to year. Bibliometric analysis using biblioshiny based on the keyword "*Network Governance*" shows that the most relevant journal sources in research related to *network governance* in public services in the Public Administration Area category *include Public Management Review, American Review of Public* Administration*, International Journal of Public Sector Management, International Review of Administrative Science*, and *the Journal of Public Administration Research and Theory.* Some of these journals are journals with the strongest relevance related to *network governance* research topics in public services.

ACKNOWLEDGEMENT

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