

## Bibliometric Analysis of Heterarchy: Toward a Paradigm Shift in Public Administration Studies

<sup>a</sup> Imanudin Kudus; <sup>b</sup> Heru Nurasa; <sup>c</sup> Ida Widianingsih; <sup>d</sup> Nina Karlina; <sup>e</sup> Jayum Anak Jawan

<sup>a b c d</sup> Padjadjaran University, Indonesia; <sup>e</sup> University Putra Malaysia, Malaysia

### BSTRAK

*Studi administrasi publik berkembang sejak Administrasi Publik Lama hingga Pelayanan dan Manajemen Publik Baru membawa manajemen dan organisasi publik bergeser dari paradigma tradisional ke paradigma modern. Organisasi semula dilihat sebagai mesin yang menekankan hierarki dan otoritas. Perspektif modern menyatakan bahwa hierarki bukan lagi strategi organisasi yang efektif. Administrasi publik yang baru mengarahkan organisasi menuju kolaborasi, konsensus, dan manajemen demokratis untuk mendorong pengembangan pendekatan heterarkis. Hasil penelitian divisualisasikan menggunakan metodologi penelitian bibliografi dan program VOSviewer. mengakses data database scopus dengan menggunakan kata kunci berikut, TITLE-ABS-KEY ("Heterarchy") AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT - TO ( SUBJAREA , "SOCI" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ). Hasil penelitian memberikan gambaran kualitas dan kuantitas artikel tentang heterarki di seluruh dunia. Tren global menunjukkan adanya minat tinggi terhadap topik penelitian ini. Di samping itu, karya-karya yang telah dipublikasikan memiliki kualitas baik, ditandai dengan jumlah sitasi yang tinggi. Untuk menemukan kebaruan, penulis mencoba mengambil topik-topik yang masih jarang diteliti. Selain itu, untuk mendapat peluang publikasi yang besar, penulis mempertimbangkan beberapa aspek, seperti negara, afiliasi, jurnal berpengaruh.*

### ABSTRACT

The study of public administration developed from the Old Public Administration to the New Public Service, bringing management and public organizations to shift from the traditional paradigm to the modern paradigm. Organizations were originally seen as machines that emphasized hierarchy. The modern perspective states that hierarchy is no longer an effective organizational strategy. The new public administration steered organizations toward collaboration, consensus, and democratic management to encourage the development of a heterarchical approach. The research results were visualized using bibliographic research methodology and the VOSviewer program. Access Scopus database data using the following keywords, title-abs-key (" heterarchy ") and ((pubstage (pubstage ") and (limit-to (doctype, "ar") and (limit-to (language, "English") and (limittoes (srctype, "j"). The research results provide an overview of the quality and quantity of articles about heterarchy around the world. Global trends indicate high interest in this research topic. In addition, the works that have been published are of good quality, marked by a high number of citations. To find novelty, the author tries to take topics that are still rarely researched. Apart from that, to get a big chance of publication, the author considers several aspects, such as country, affiliation, influential journals.

### ARTICLE HISTORY

Submitted: 31 03 2024

Revised: 23 04 2024

Accepted: 06 05 2024

Published: 08 06 2024

### KATA KUNCI

Administrasi Publik; Organisasi Publik; Hirarki; Heterarki; Bibliometrik

### KEYWORDS

Public Administration; Public Organization; Hierarchy; Heterarchy; Bibliometric

## INTRODUCTION

The science of public administration in concept and practice has adopted various disciplines during its development (Farrell et al., 2022). The study of public administration has always been interdisciplinary ontologically, as evidenced by the epistemological and methodological diversity deriving from the different disciplinary concepts and theories used (Raadschelders, 2008). The science of public administration continues to develop over time. Thus far, the field of public administration has told the tale of how field direction changed from the Old Public Administration paradigm to the New Public Management paradigm (Indahsari & Raharja, 2020; Lynn, 2001).

The development of public administration science in dealing with problems and challenges also brought developments in the realm of management and organization from the classical paradigm to the modern paradigm. In the classical paradigm, the organization is seen as an engine driven by management plans and controls (Daniels et al., 1997). An organization must have a clear system and authority in line with Weber's explanation, an organization needs to be designed as closely as possible to a machine by emphasizing a clear hierarchy and authority system, division of labor with specialization, a comprehensive set of regulations, flawless work processes, impersonal (rather than interpersonal) interactions in human resource management, and the advancement and selection of employees based on their technical proficiency (Weber, 1946). However, Weber's opinion is considered less in accordance with the needs of the organization during its development. Thus, the concept of linking pins developed by Resis Likert emerged, where each organizational unit needs to have a leader (supervisor) to connect group work to other groups and support orientation to the top level and encourage participation and contribution in planning, more open communication, and commitment from each member (Katzell, 2014). The involvement of these members of the organization can lead to the process of interpersonal communication, group dynamics, and the attitudes and values of organizational members which is something more important than a stable organizational structure and design, in determining organizational effectiveness (Bruce & Nyland, 2011).

The hierarchy seen in bureaucracies is no longer a useful organizational strategy in the New Public Administration, according to the Minnowbrook Conference. The new public administration must push the organization towards cooperation, consensus, and democratic administration that is not authoritarian to produce effectiveness in the organization. The contemporary idea of public administration needs to be based on democratic principles, more flexible, and more sensitive to shifts in the political, social, and economic spheres (Frederickson et al., 2003). In line with this, the concept of heterarchy was born, which reflects openness in various aspects involving relationships to decision making among organisational members. The pattern of heterarchy, which is considered more relevant to the conditions of Public Administration in the present, has attracted the interest of many researchers to dig deeper into this concept. However, there is no research that specifically identifies the trend of article publications regarding heterarchy in public administration studies. Therefore, this study aims to analyse the bibliometric characteristics of journal articles on heterarchy in public administration studies.

## Literature Review

The development of the concept of the organization also develops the power order of the organization (Sikorski & Bienkowska, 2021). In the social sciences, power is identified with a "tiered and ranked" hierarchical pattern (Crumley, 1995). This presumption has historically given rise to scientific racism, colonialism, and other forms of dominance as

well as their moral and intellectual justifications (Crumley, 1995). In its development, organizations are aware of human nature and effective ways to motivate them to work. Because basically all humans are fluid in nature, interdependent, and have levels and links that are rich in networks (Crumley, 1995). Thus organizations begin to distinguish between management functions and leadership functions with the assumption that people are valuable assets for organizations that need investment and stimulation for self-control and development (Kotler & Caslione, 2009). At an advanced level organizational members can determine their goals for the implementation of the main goals (Stein, 2010), and also have autonomy and freedom of action and eliminate rigidity, without leaving the overall values of the organization, such as quality, trust, and credibility (Petres & Waterman, 2006)

In addition to changes in which they treat members of the organization, the way the organization works has also changed. Organizations are beginning to abandon rigid hierarchical patterns for customizable and flexible tasks. At the same time, it is assumed that each member of the organization has a potential opportunity to lead the team, which leads to further devolution of power (Jolanta Bieńkowska, 2016). Numerous social power structures that arose as a critique of the presumption of hierarchy in power interactions are documented in the archeological record (Crumley, 1995).

A management and leadership pattern is included in the framework of the new public administration order and the idea of reinventing government (Frederickson, 1996). Reimagining government and new public administration share several similarities in terms of how they approach leadership and management. Both demand democratic group work practices, cooperation, authority delegation in groups, and worker empowerment (Frederickson et al., 2003). The new public administration's unwavering commitment to providing effective professional public service, its equitable implementation of public policies, and the reinvention movement's methodical deconstruction of bureaucracy are the most significant management and leadership distinctions between it and reinventing government (Frederickson et al., 2003).

Collaborative governance is “a governance arrangement in which one or more public institutions directly engage non-state stakeholders in a formal, consensus-oriented, deliberative collective decision-making process aimed at making or implementing public policies or managing public programs or assets” (Ansell & Gash, 2008). An effective collaborative governance framework that explains how to help various stakeholders make decisions together could be a means to address the imbalance (bias converted to devolution) of power (Susanti et al., 2019). Furthermore, in the process of developing an organizational model, the pentahelix is a conceptual framework that involves academia, government, industry, non-governmental organizations, civil society, or social/media entrepreneurs who are believed to be able to pursue innovation through collaboration and synergy. The collaboration of government organizations through the pentahelix model encourages the creation of innovation and positive change for the community (Halibas et al., 2017).

Additionally, after undergoing organizational cooperation to meet its objectives for organizational growth. For instance, in a multi-organization, distinct actors engage in a variety of shared tasks while maintaining distinct organizational mandates and aims (Raju and Becker 2013). Actors involved in the multi-organization are policy makers or stakeholders. Any individual, company, or group of individuals who has the potential to influence or be influenced by the accomplishment of corporate goals can be considered a stakeholder (Freeman & McVea, 2005). With so many parties involved, the dynamics that occur will be even more complicated. But in multi-organizations, it is not the differences in roles and responsibilities itself that causes the problem, instead, it's because the performers don't fully comprehend their own roles and duties or those of others that they must collaborate with (Gryszkiewicz & Chen, 2010).

The coordination system that has tiers such as superiors and subordinates is a hierarchy. Hierarchy itself can be interpreted as an instrument in which people are organized within the company, it is very important for the organization's ability to coordinate complex activities and manage resources effectively (W., 1990). In the context of hierarchies, influence and authority in organizations are considered legitimately derived from individual positions in formal hierarchies (Meske et al., 2020). Therefore, hierarchy is essential to an organization's success and aids in the formal integration of official positions within a clear organizational structure. A formal structure like this denotes a set of things that are equal, superior, or lesser and explains the inherent process that organizes all social systems into hierarchies based on groups (Putzke et al. 2010). The larger the social system of an organization, the more complicated or complex the situation will be. Complexity itself is a situation caused by the occurrence of transitions that occur either simultaneously or suddenly. Complexity emphasizes interactions and feedback that can change the system (Therrien et al. 2017). However, with the complexity that occurs, the interaction between the various parts of the management system and collaboration between organizations can increase (Indahsari & Raharja, 2020).

The application of Hierarchy in the pattern of organizational relationships at complex organizational levels often runs inefficiently, the study conducted a new pattern approach called Heterarchy in the relationship of an organizational network to deal with a problem outside of the planned hierarchical activities (McCulloch 1945). In a heterarchical pattern, authority is not in one center of power (absolute) but it would be better if it was divided into branches within the organization. Meanwhile, the center of the organization only controls and provides rewards and punishments (Hedlund, 1986)

Heterarchy reflects and brings openness in all aspects including the operation and distribution of decision-making among organizational members. The concept of heterarchy that is applied implies the relationship of organizational members who depend on each other and have trust in all members of the organization, therefore heterarchy is a complex and effective adaptive system, governed by various non-hierarchical principles (Espinosa et al. 2007; (Leminen et al., 2018).

In the pattern of politics and power, hierarchy and heterarchy have their advantages and disadvantages. Hierarchical politics and power have a strong administrative character (authoritarian state, oligarchy, hyperhierarchy) because of a clear chain of decision-making and quick response. This occurs because the rules and responsibilities are familiar, political interaction among decision makers are few and formalized, and the political maintenance of the system is low. However, hierarchical policies are at a disadvantage because data collection techniques, associated with pyramidal decision-making frameworks, slow the arrival of certain types of information (especially subversive activities) at the top of the pyramid and require formalization and elaboration.

Decisions are not always popular; People's dissatisfaction is high and there must be a sizable investment in coercion or propaganda, therefore it has high costs (Crumley, 1995).

While in heterarchical patterns of politics and power, administrators in governments with strong heterarchical organizations receive good quality information from many sources inside and outside the decision-making area. In general, the decisions given are fair and reflect popular consensus. Decision makers hear various solutions to problems from different segments of society so that it is more integrated and brings enthusiasm. But heterarchical governments are at a disadvantage because consensus is slow to reach, increasing the time it takes to make decisions. So it requires a considerable investment of time and energy as well as constant maintenance (Crumley, 1995).

## RESEARCH METHODS

In this study, a bibliographic research method was used, in which the researcher used a descriptive bibliometric study and utilised a literature review. Bibliometric analysis is one method of evaluating research results on previously existing papers. The method aims to quantitatively analyse the results of literature data research (Donthu et al., 2021). In addition, researchers also use VOSviewer software in visualising the research data conducted (Saputra et al., 2023; Widianingsih et al., 2021). VOSviewer is used because it can present the results of the analysis so that a clear bibliometric map is formed (Eck & Waltman, 2017; Orduña & Costas, 2021; McAllister, Lennertz, & Atencio, 2022).

The data retrieval conducted in this study utilised the Scopus database which was conducted on 16 July 2022. The keywords used in this study are: TITLE-ABS-KEY ( 'Heterarchy' ) AND ( LIMIT-TO ( PUBSTAGE , 'final' ) AND ( LIMIT-TO ( DOCTYPE , 'ar' ) ) AND ( LIMIT-TO ( SUBJAREA , 'SOCI' ) ) AND ( LIMIT-TO ( LANGUAGE , 'English' ) AND ( LIMIT-TO ( SRCTYPE , 'j' ) ). The use of Scopus is because articles that have been published in the database are widely used as references in bibliometric analysis (Utama et al., 2019).

Based on the results of the articles that have been obtained, 118 articles related to the topic of heterarchy have been generated which can be analyzed and visualized. Furthermore, articles related to the heterarchy topic will be analyzed for data visualization using VOSviewer software. The results of the analysis from this research are then divided into several parts, the first is the keywords relations mapping which is further divided into several parts including network visualization, overlay visualization and density visualization. Then the second is mapping by author. The third is mapping by country. The fourth is mapping by organization. The fifth is mapping by publications journals. The sixth is the top 10 publications of heterarchy, and lastly, is based on the definition of heterarchy.

In order for this research to produce detailed and transparent findings, a systematic review was also carried out. Systematic reviews are methods used to synthesize/integrate several elements in order to produce something new from the available evidence against those discussed in this study so that existing questions are answered, the hypotheses tested, developed new theories, or reviewed the effectiveness of interventions (Gough, D., Oliver, S., & Thomas, 2017). In simple terms, systematic reviews can be distinguished from narrative reviews based on their purpose. In general, narrative reviews in systematic reviews present arguments or summarize what is known about a topic (Petticrew, M., & Roberts, 2006).

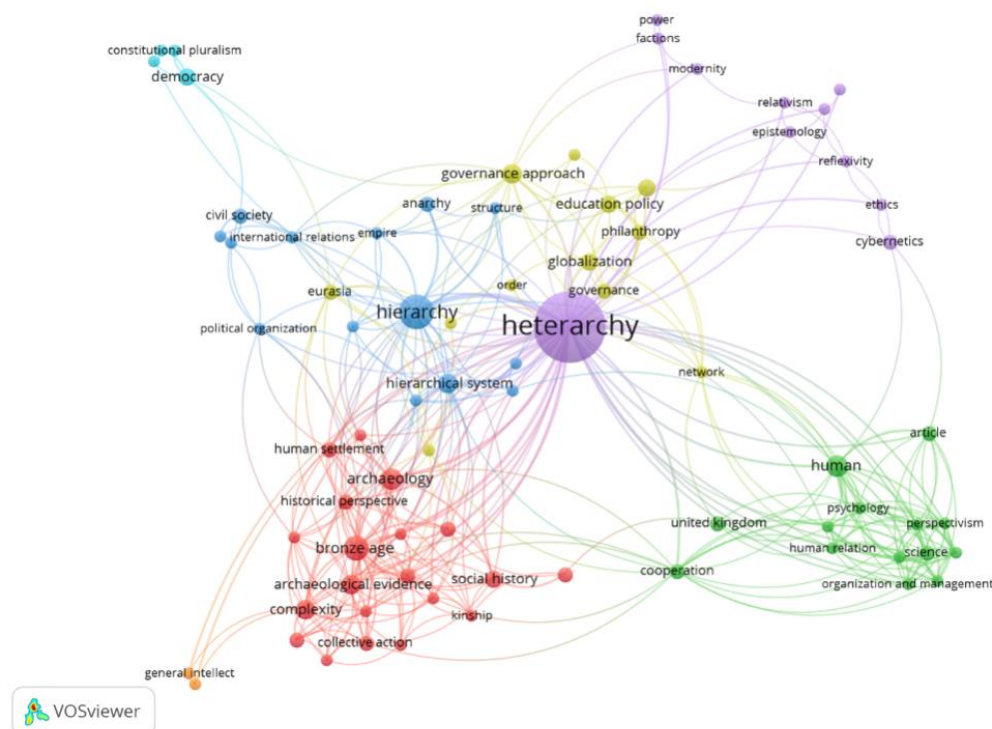
## RESULTS AND DISCUSSIONS

### Keywords Relation Mapping

#### a) Network Visualization

Scopus data that has been downloaded is then saved in the CSV format. To perform relation mapping, the VOSviewer application is used which can visualize CSV data from Scopus which can then be analyzed. With a minimum of 2 keywords that are repeated using the co-occurrence tool, it produces 81 keywords or topics that meet the threshold of the 632 total keywords. Co-occurrence analysis itself aims to see statistical data on topics in scientific papers through the keywords used. The following are the results of data visualization using the VOSviewer application:

**Graph 1.**  
**Network Visualization**

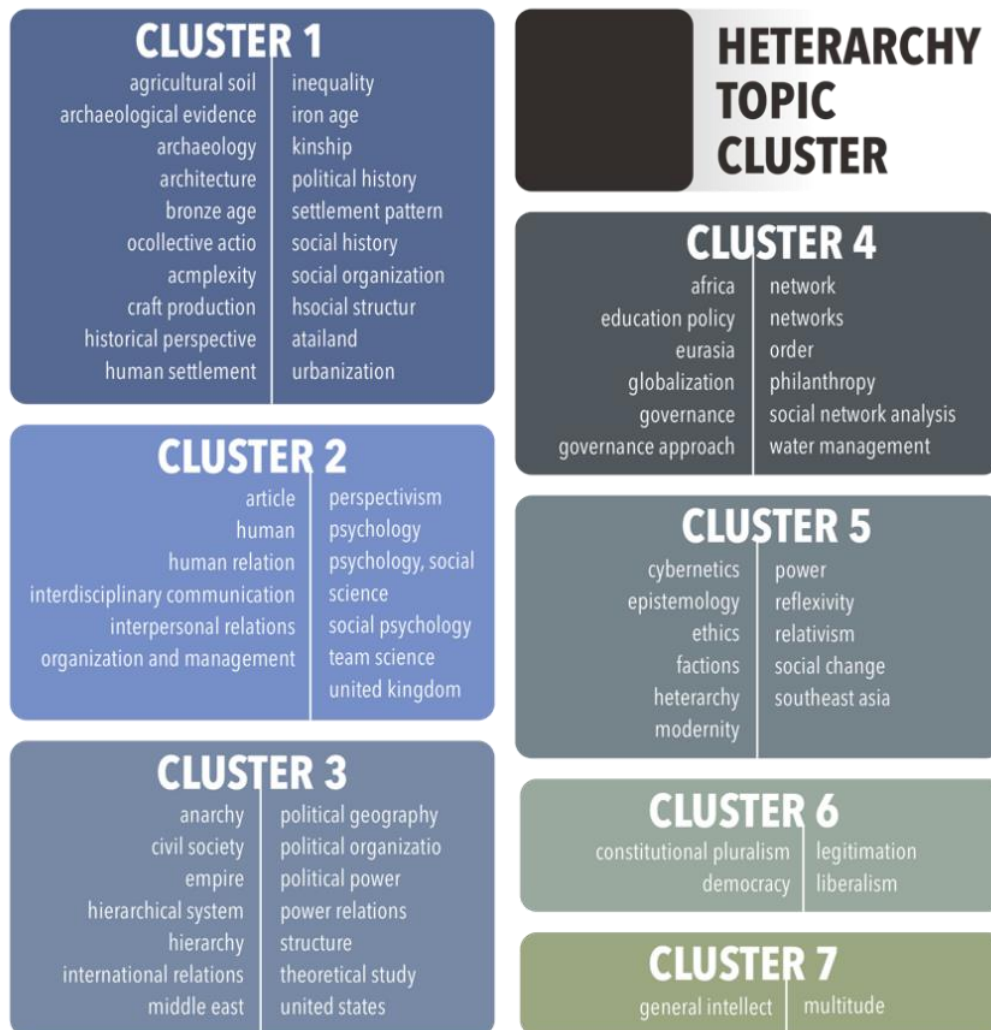


Source: Processed by the author using the VosViewer application, 2024

The spacing and size of the circles indicate the number of keywords. The larger the circle, the more keywords appear and relate to each other. The keyword that appears the most and has

the largest number and strength of the network is 'Heterarchy'. Then in the second position there is the keyword 'hierarchy' which basically has a strong relationship with the concept of heterarchy. From the data visualization, 7 clusters were found in the heterarchy study. The total link strength on the topic of heterarchy reaches 544. The following are the seven clusters on the topic of heterarchy:

**Graph 2.**  
**Seven Heterarchy Topic Clusters**



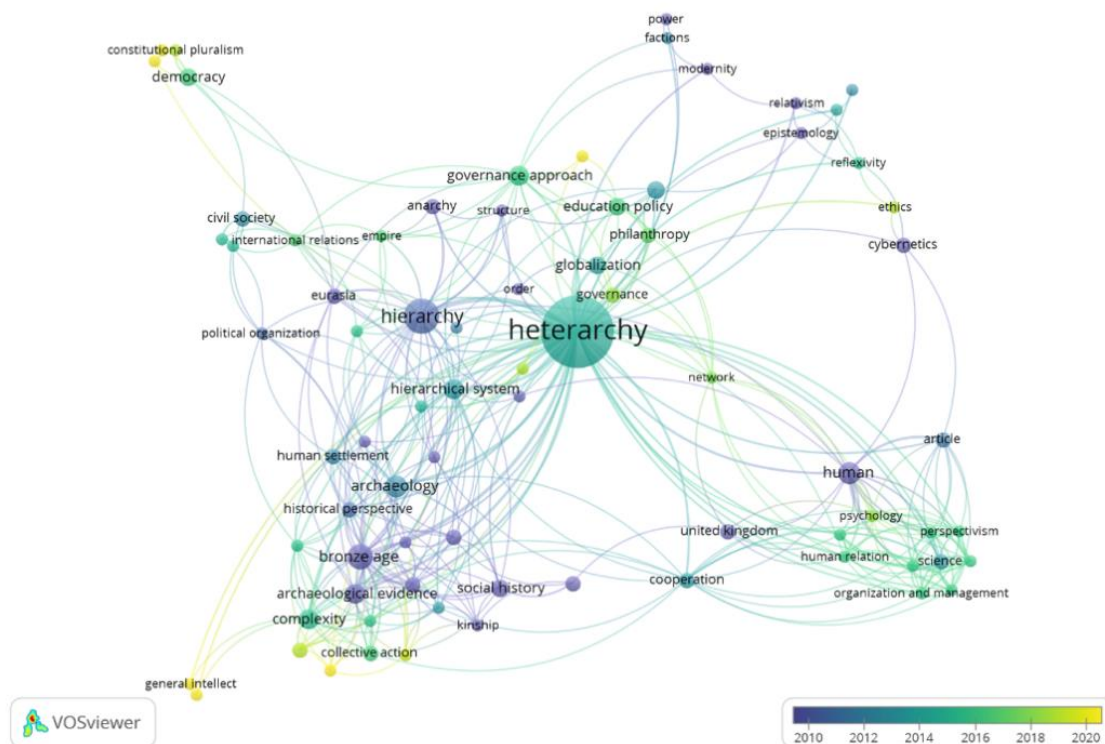
Source: Processed by the author, 2024

#### **b) Overlay Visualization**

Furthermore, there is an overlay visualization which is also known as a historical trace. This form of visualization aims to display keyword mapping based on the year of publication of the article (Zakiyyah & Winoto, 2022). When viewed from the overlay visualization, research in heterarchical literature studies is visualised as follows:



**Graph 3.**  
**Overlay Visualization**



Source: Processed by the author using the VosViewer application, 2024

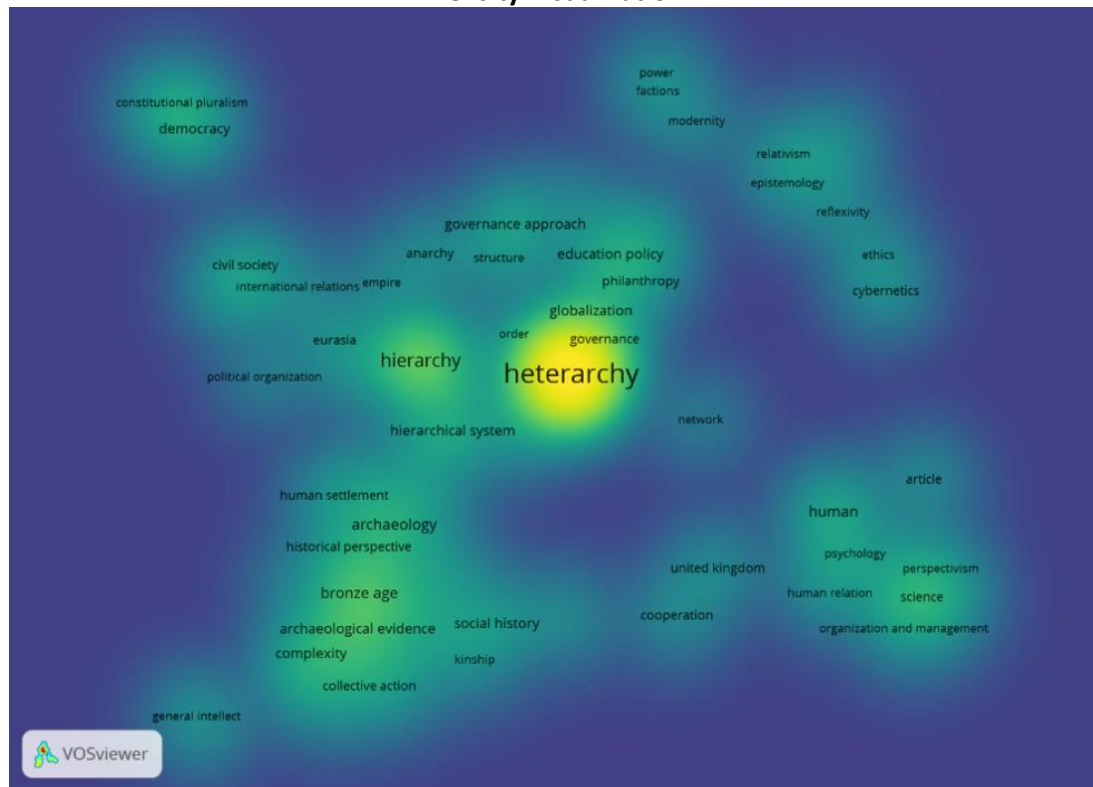
The bibliometric map shown in Figure 3 is an overview of the development of research topics on heterarchy each year. The results of the overlay analysis show that the development of topics in 2010-2012 was related to hierarchy, anarchy, structure, power, modernity, cybernetics, social history, and humans. Then the topic development for 2014-2016 is related to Heterarchy, globalisation, civil society, democracy, corporations, organisations and management, and complexity. Then the topic development for 2018-2020 is related to governance, education policy, philanthropy, governance approaches, reflexivity, ethics, psychology, collective action, constitutional pluralism, and general intellectuality.

### c) Density Visualization

The next bibliometric map visualization relates to the density of the research group. This type of visualization is commonly known as density visualisation. This type of visualization can find out which keywords are most widely used in a study (Kahfi, et al., 2022). The density in research groups in heterarchical studies is visualised as follows:



### Graph 4. Density Visualization



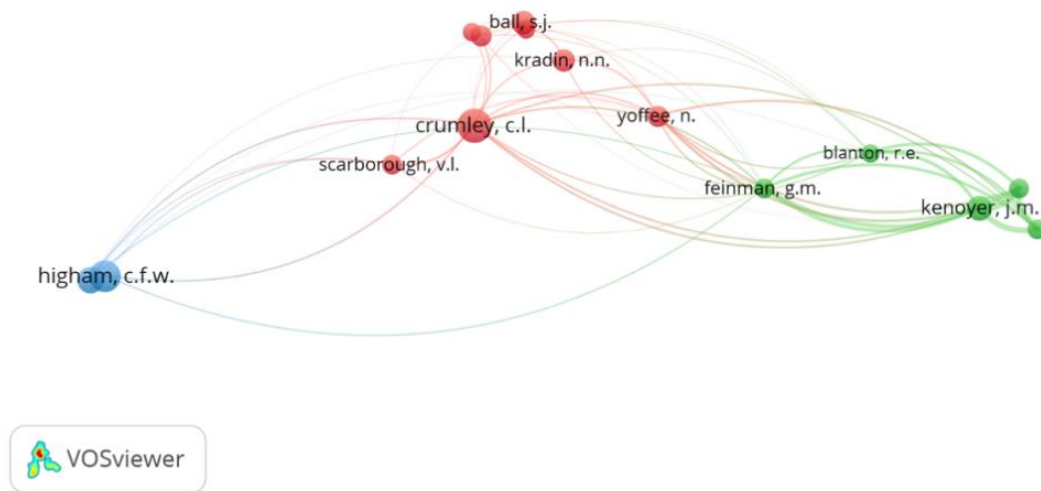
Source: Processed by the author using the VosViewer application, 2024

The results of the bibliometric analysis of the density visualization as shown in the graph above show the distribution and different colours for each keyword. The colour represents the level of saturation which means that the darker the colour of a keyword, the less frequently the topic is researched. Vice versa, the lighter the colour of a keyword, the more extensively the topic is researched. Examples of topics that are still rarely researched include modernity, power functions, general intellect, political organisation, and many more. While topics that have high density and have been widely used include heterarchy, hierarchy, bronze age, archaeological evidence, complexity, and so on.

#### d) Mapping By Author

Using the co-citations tool with the cited author unit of analysis. In addition, the co-authors tool is also used to see the co-authorship network between authors. Author analysis aims to map the level of productivity of an author in publishing his/her works both as a single author and a collaborating author. The search results showed that there were 7359 authors identified. Next, we determined the minimum citation limit of 20 citations to produce 16 authors. Here are the authors with the highest number of citations and the highest total link strength:

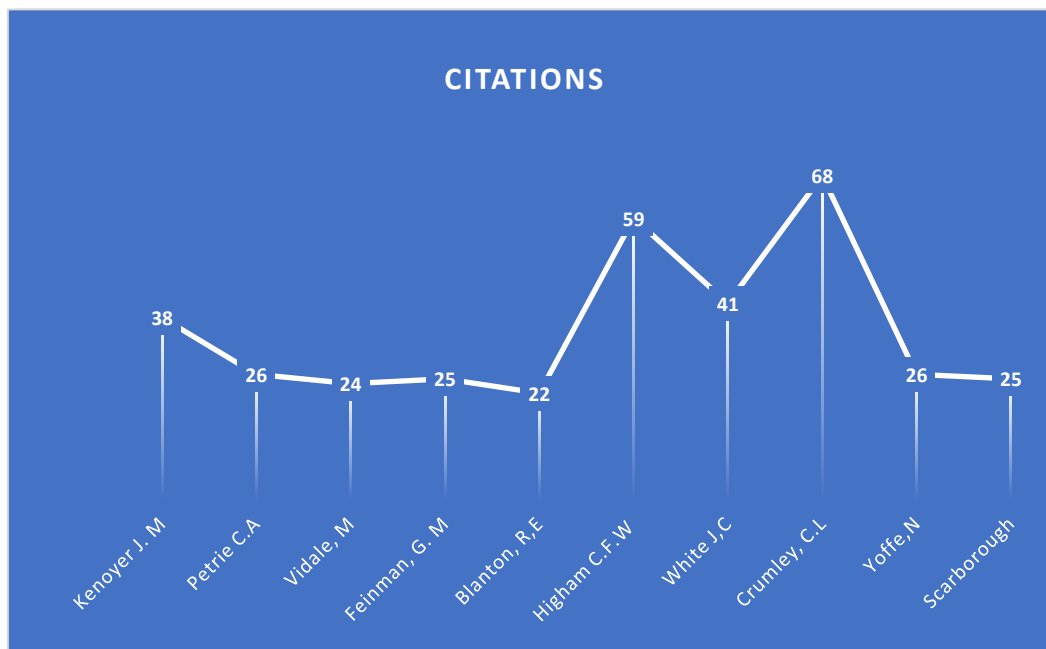
**Graph 5.**  
**Authors Visualization**



Source: Processed by the author using the VosViewer application, 2024

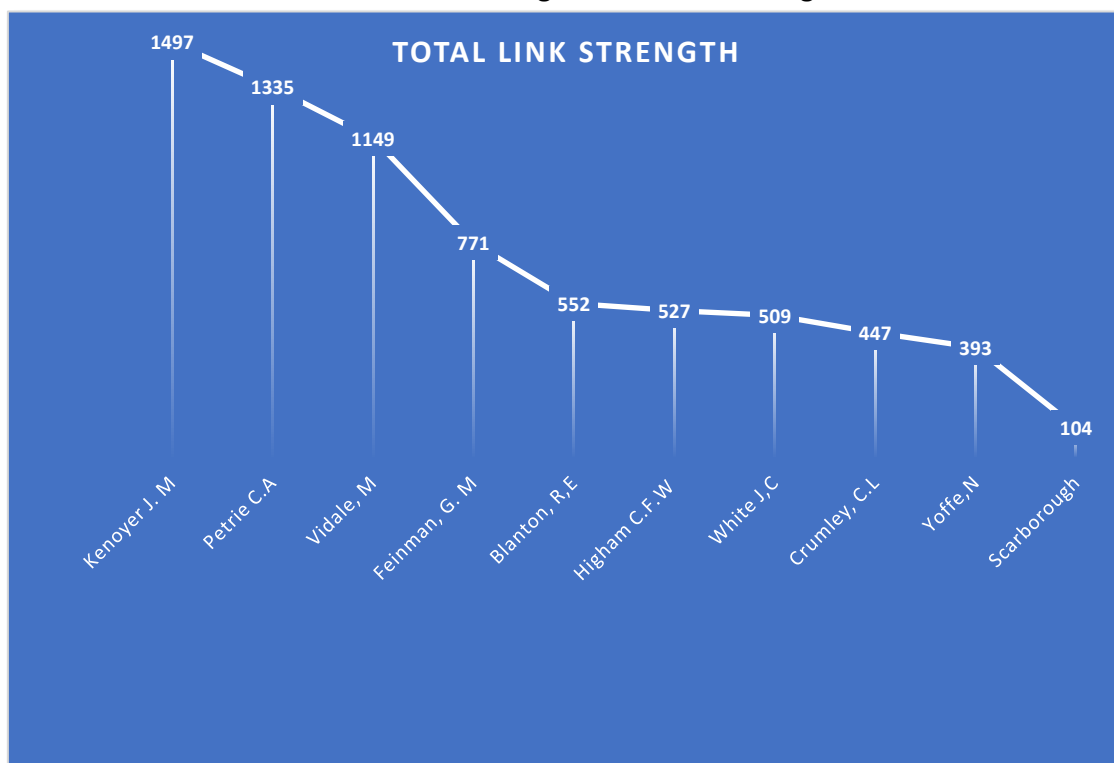
The various spheres in the graph above represent the number of publications an author has made on a scientific topic. Meanwhile, the lines connecting the circles represent the strength of the radius that an author has in publishing his work. Then the position of the distribution of circles that are close to each other or far apart indicates a homogeneous or heterogeneous character among authors. In more detail, the results of the author identification can be seen below:

**Graph 6.**  
**Authors With The Most Ciatations**



Source: Processed by the author using the Scopus database, 2024

**Graph 7.**  
**Authors With the Highest Total Link Strength**



Source: Processed by the author using the Scopus database, 2024

The results of the author analysis related to the topic of heterarchy show 10 authors with the highest number of citations and the highest total link strength. Based on the data visualization presented in the three graphs, it can be seen that Crumley, C.L. is the author who gets the most citations to reach 68 citations. While Kenoyer J.M. is the author who has the largest total link strength to reach 1497.

#### **e) Mapping By Country**

Mapping the geographical distribution patterns of scientific article publications aims to identify influential countries that have funding opportunities or research assistance that can make it easier for an author to publish their work. With a minimum number of documents set to 1, the software produced 32 countries that meet the threshold. Countries with large circles indicate a high frequency of publication. The country mapping visualization findings using the VOSviewer application are as follows:

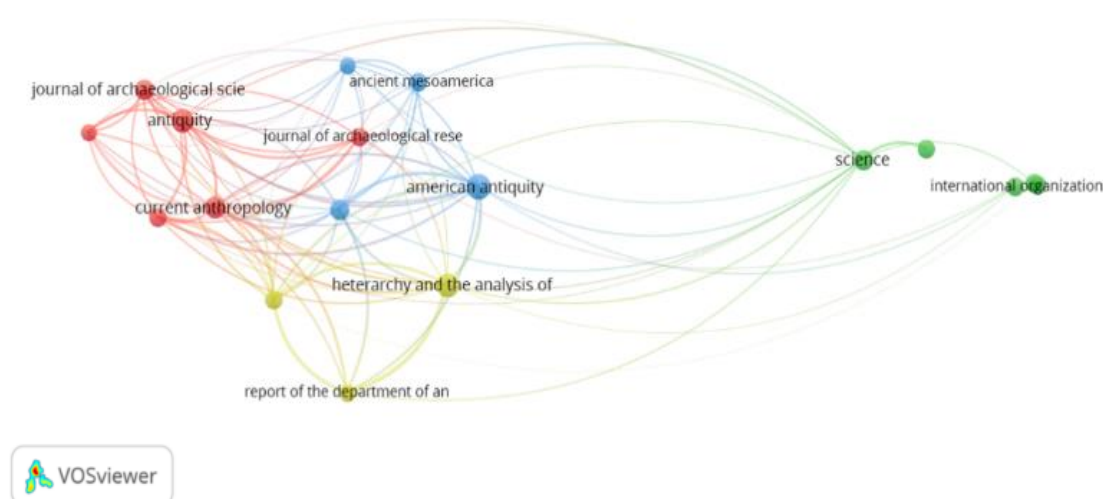


As a result of the analysis of the author's affiliations, there are five organizations that are considered the most influential. Four of them are organizations located in the United States with each having a total network strength of 750. While the other one comes from Russia with a total network strength of 390. The five organizations are, Borough Manhattan Comm. Coll.-Cuny; Department of Anthropology, Washington State University; University of Michigan, Ann Arbor, MI; Washington State University, Pullman, WA; Center for Social Anthropology, Russian State University for the Humanities, Moscow.

### g) Mapping By Publication Journals

Mapping by journal aims to identify potential journals and publishers for authors. By doing so, it is expected that the author will have a greater opportunity to publish his work. With a minimum number of documents 1 produces 5307 Publication journals. Furthermore, filtering is carried out by entering a minimum number of 20 citations to produce 18 publication journals that meet the threshold. The following are the results of the visualization of journal publications:

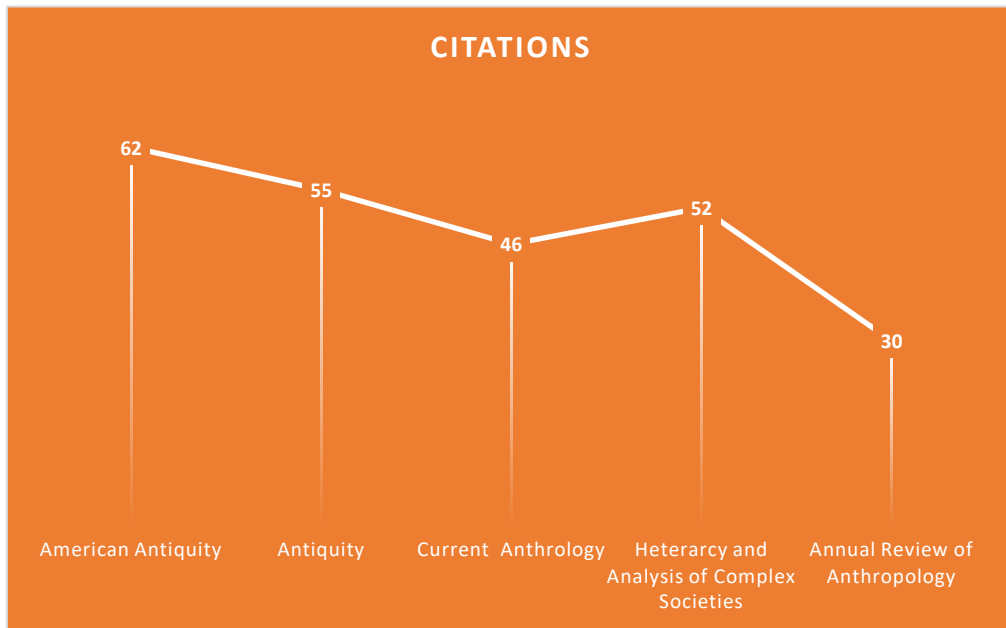
**Graph 10.**  
**Publication Journals Visualization**



Source: Processed by the author using the VosViewer application, 2024

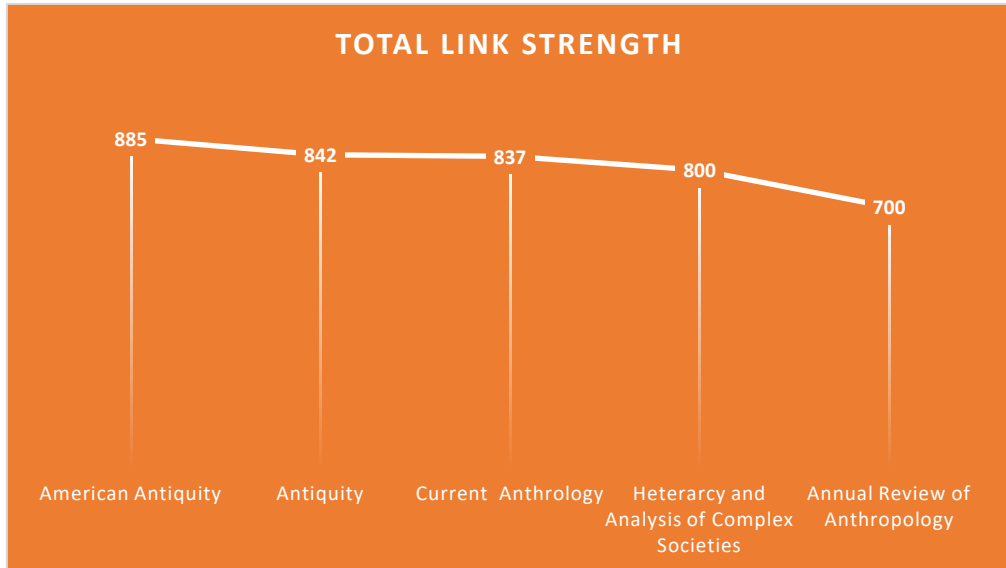
The bibliometric visualization above shows some names of influential journals that publish many articles on heterarchy. The results of the analysis show that five journal publications are considered the most influential because they have the highest citations and total link strength. In more detail, the results of the identification of these authors can be seen below:

**Graph 11.**  
**Publication Journals with The Most Citations**



Source: Processed by the author using the Scopus database, 2024

**Graph 12.**  
**Publication Journals with The Highest Total Link Strength**



Source: Processed by the author using the Scopus database, 2024

The first-place journal with the highest number of citations and total link strength is Americal Antiquity. The journal, which is under the publisher Cambridge University Press, has a total number of citations of 62 and a total link strength of 885. Then in second position there is the Antiquity journal which has a total number of citations of 55 and a total link strength of 842. Then in the third, fourth, and fifth positions are the journals Current Anthrology, Heterarcy and Analysis of Complex Socuenties, and Annual Review of Anthropology, respectively.



## Top 10 Publications of Heterarchy

To see the most influential articles, we used a citation mapping of published articles on heterarchy. The number of citations can reflect how much influence an article has on the scientific field. The number of citations is influenced by the age or year of publication of the journal. In the table below, we found the 10 articles with the most citations during 1945-2022 using Scopus data with the publish or perish application:

**Table 1.**  
**Top 10 Publications of Heterarchy**

Author	Title	Year	Cite
<b>G. Hedlund</b>	The hypermodern MNC—A heterarchy?	1986	856
<b>C. Crumley</b>	Heterarchy and the Analysis of Complex Societies	1995	378
<b>G. Grabher</b>	Ecologies of creativity: The village, the group, and the heterarchic organisation of the British advertising industry	2001	346
<b>W.S. McCulloch</b>	A heterarchy of values determined by the topology of nervous nets	1945	169
<b>J. Dréo</b>	Continuous interacting ant colony algorithm based on dense heterarchy	2004	154
<b>E.M. Brumfiel</b>	Heterarchy and the Analysis of Complex Societies: Comments	1995	121
<b>J. White</b>	Incorporating Heterarchy into Theory on Socio-political Development: The Case from Southeast Asia	1995	83
<b>P.S. Keswani</b>	Hierarchies, heterarchies, and urbanization processes: The view from bronze age Cyprus	1996	70
<b>R. Joyce</b>	Heterarchy, history, and material reality: "Communities" in late classic honduras	2012	66
<b>D.R. Potter</b>	A Heterarchical Approach to Lowland Maya Socioeconomies	1995	66

Source: Processed by the author using the Scopus database, 2024

Based on the identification results, the most cited article is entitled "The hypermodern MNC-A heterarchy?", by G. Hedlund. This article, published in 1986, has the highest number of citations, which is 856 times. Furthermore, there is an article entitled "Ecologies of creativity: The village, the group, and the heterarchic organization of the British advertising industry", by C. Crumley. This article, published in 2001, occupies the second position with 378 citations. Then in the third position there is an article entitled "A heterarchy of values determined by the topology of nervous nets", by G. Grabher. The oldest article published in 1945 has been cited 346 times. Then for the fourth to tenth positions are occupied by articles published in the period 1995 to 2012. At the time of this research, these articles had no more than 200 170 citations.

The ten most influential articles were written by different authors. This then has implications for the ideas or concepts introduced by each author. Despite this, basically every concept offered contributes greatly to the development of scientific studies, especially related to heterarchy. The table below presents some definitions of heterarchy from each author who has an influential article:

**Table 2.**  
**Definition of Heterarchy**

Author	Title	Definitions
<b>G. Hedlund</b>	The hypermodern MNC—A heterarchy?	As a result, hierarchy is essential to an organization's success and aids in the formal integration of official positions within a clear organizational structure. A formal structure like this denotes a set of things that are equal, superior, or lesser and explains the inherent process that organizes all social systems into hierarchies based on groups.
<b>C. Crumley</b>	Heterarchy and the Analysis of Complex Societies	Heterarchy provides a framework for thinking about change in the geographical, temporal, and cognitive domains while addressing the range of interactions between system constituents. Although the work that they undertake is incredibly diverse, definitions of heterarchy are strikingly consistent across a variety of fields, and when put together, they allow for a clear description.
<b>G. Grabher</b>	Ecologies of creativity: The village, the group, and the heterarchic organisation of the British advertising industry	The conceptual tools for the investigation of the organizational logic of the Group and the Village are provided by these two fundamental characteristics of hierarchies. 1) Heterarchy of Location; 2) Heterarchy of Function
<b>W.S. McCulloch</b>	A heterarchy of values determined by the topology of nervous nets	-
<b>J. Dréo</b>	Continuous interacting ant colony algorithm based on dense heterarchy	"[An] ant colony is a special kind of hierarchy, which can usefully be called a heterarchy. This means that the properties of the higher levels affect the lower levels to some degree, but induced activity in the lower units feeds back to influence the higher levels".
<b>E.M. Brumfiel</b>	Heterarchy and the Analysis of Complex Societies: Comments	"Each element possesses the potential of being unranked (relative to other elements) or ranked in a number of different ways" is the definition of a heterarchy organizational structure.
<b>J. White</b>	Incorporating Heterarchy into Theory on Socio-political Development: The Case from Southeast Asia	Significant phenomena that have been overlooked or underappreciated about heterarchy in the study of the evolution of Southeast Asian and perhaps other cultures are flexible hierarchy and horizontal or lateral differentiation.
<b>P.S. Keswani</b>	Hierarchies, heterarchies, and urbanization processes: The view from bronze age Cyprus	A new perspective on the analysis and interpretation of such events is provided by alternative models based on the idea of heterarchy, or complexity that is not always connected to highly centralized social-political structures.

Author	Title	Definitions
<b>R. Joyce</b>	Heterarchy, history, and material reality: "Communities" in late classic Honduras	The advantage of heterarchy is that it allows us to see societal complexity without the a priori imposition of a hierarchical straight-jacket on our data.
<b>D.R. Potter</b>	A Heterarchical Approach to Lowland Maya Socioeconomics	We believe that the idea of heteroarchy offers a more comprehensive understanding of the Maya economy since it does not presuppose that complexity must manifest itself in a hierarchical structure with tiers.

Source: Processed by the author using the Scopus database, 2024

## CONCLUSIONS

Public Administration is an interdisciplinary field of study that continues to develop over time. Developments in this field of study are also related to the widely recognized paradigm shift in Public Administration. In line with this, new concepts emerged as criticism as well as development of previously existing concepts. One that was born during the NPM Public Administration paradigm was heterarchy. This concept is an opposing form of hierarchy introduced by Weber. The concept of heterarchy, which is closely related to flexibility in the network of relationships as well as the decision-making process, is considered relevant to the latest developments that encourage an organization to be open and adaptive. Therefore, many authors are interested in examining more about this concept.

After going through a series of predetermined procedures, the literature search on articles about heterarchy resulted in 118 related documents. Through co-occurrence analysis, several keyword clusters related to research topics on heterarchy were found. To create novelty, the author can develop topics that are still not widely researched, such as modernity, power functions, general intellect, political organization. Furthermore, co-citations and co-authors analysis were also conducted to see the most influential authors who have successfully published many works on heterarchy. One of the most influential authors on this topic is Crumley, C.L with his popular work entitled "Ecologies of creativity: The village, the group, and the heterarchic organization of the British advertising industry". A mapping of influential countries, organizations, and journals was also conducted to help authors find greater publication opportunities. Potential countries that authors can consider are the United States, United Kingdom, Germany, Russia, and Italy. Then for the most influential affiliated organization is Borough Manhattan Comm from the United States. As for journals that have a great opportunity to publish articles on heterarchy, Americal Antiquity is under the publisher Cambridge University Press.

## REFERENCES

- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543–571. <https://doi.org/10.1093/jopart/mum032>
- Bruce, K., & Nyland, C. (2011). Elton mayo and the deification of human relations. *Organization Studies*, 32(3), 383–405. <https://doi.org/10.1177/0170840610397478>
- Crumley, C. L. (1995). Heterarchy and the Analysis of Complex Societies. *Archaeological Papers of the American Anthropological Association*, 6(1), 1–5. <https://doi.org/10.1525/ap3a.1995.6.1.1>
- Daniels, D, T., Spiker, K, B., Papa, & J., M. (1997). *Perspective on Organizational Communication 4th*. McGraw-Hill.

- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to Conduct a Bibliometric Analysis: An Overview and Guidelines. *Journal of Business Research*, 133, 285–296.
- Eck, N. J. van, & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, 111(2).
- Farrell, C., Hatcher, W., & Diamond, J. (2022). Reflecting on Over 100 Years of Public Administration Education. *Public Administration*, 100. <https://doi.org/10.1111/padm.12808>
- Frederickson, George, H., & Smith, K. B. (2003). *The Public Administration Theory Primer*. Westview Press.
- Frederickson, H. G. (1996). Comparing the Reinventing Government Movement with the New Public Administration. *Public Administration Review*, 56(3), 263–270.
- Freeman, R. E. E., & McVea, J. (2005). A Stakeholder Approach to Strategic Management. *SSRN Electronic Journal*, January. <https://doi.org/10.2139/ssrn.263511>
- Gough, D., Oliver, S., & Thomas, J. (2017). *An introduction to systematic reviews* (Second Ed.). Sage Publishing.
- Gryszkiewicz, A., & Chen, F. (2010). Design requirements for information sharing in a crisis management command and control centre. *ISCRAM 2010 - 7th International Conference on Information Systems for Crisis Response and Management: Defining Crisis Management 3.0, Proceedings, May*, 1–10.
- Halibas, A. S., Sibayan, R. O., & Maata, R. L. R. (2017). The penta helix model of innovation in Oman: An Emirati perspective. *Interdisciplinary Journal of Information, Knowledge, and Management*, 12, 159–172.
- Hedlund, G. (1986). *Hypemodem MNC-A Heterarchy ?* 25(1), 9–35.
- Indahsari, C. L., & Raharja, S. J. (2020). New Public Management (NPM) as an Effort in Governance. *Jurnal Manajemen Pelayanan Publik*, 03(2), 73–81.
- Jolanta Bieńkowska. (2016). Evolution of Organizational Power. *China-USA Business Review*, 15(6). <https://doi.org/10.17265/1537-1514/2016.06.003>
- Kahfi, A. A., Rizal, M., & Herawati, T. (2022). Pemetaan bibliometrik dengan VOSviewer terhadap perkembangan hasil penelitian implementasi good corporate governance. *Research Journal of Accounting and Business Management (RJABM)*. <https://doi.org/10.1111/fcre.12621>
- Katzell, R. A. (2014). *New Patterns of Management . by Rensis Likert Review by : Raymond A . Katzell*. 8(2), 273–275.
- Kotler, P., & Caslione, J. (2009). More Praise for Chaotics from Around the World. In *International Business*.
- Leminen, S., Rajahonka, M., Westerlund, M., & Wendelin, R. (2018). The future of the Internet of Things: toward heterarchical ecosystems and service business models. *Journal of Business and Industrial Marketing*, 33(6), 749–767. <https://doi.org/10.1108/JBIM-10-2015-0206>
- Lynn, L. E. (2001). The myth of the bureaucratic paradigm: What traditional public administration really stood for. *Public Administration Review*, 61(2), 144–160. <https://doi.org/10.1111/0033-3352.00016>
- McAllister, J.T., Lennertz, L., & Atencio Mojica, Z. (2022). Mapping A Discipline: A Guide to Using VOSviewer for Bibliometric and Visual Analysis. *Science and Technology Libraries*, 41(3), 319–348. <https://doi.org/10.1080/0194262X.2021.1991547>
- McCulloch, W. S. (1945). A heterarchy of values determined by the topology of nervous nets. In *The Embodiment to Mind*. MIT Press.
- Meske, C., Kissmer, T., & Stieglitz, S. (2020). Bridging formal barriers in digital work environments – Investigating technology-enabled interactions across organizational hierarchies.

- Telematics and Informatics*, 48(January), 101342.  
<https://doi.org/10.1016/j.tele.2020.101342>
- Orduña-Malea, E. & Costas, R. (2021). Link-based approach to study scientific software usage: the case of VOSviewer. *Scientometrics*, 126(9), 8153–8186.  
<https://doi.org/10.1007/s11192-021-04082-y>
- Ortiz-de-Mandojana, N., Bansal, P. (2016). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, 37(8), 1615–1631
- Petres, T. J., & Waterman, R. H. (2006). *Dalam mencari keunggulan: Pelajaran dari perusahaan yang dikelola terbaik di Amerika*. Harper Bisnis.
- Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. Blackwell Publishing.
- Raadschelders, J. C. N. (2008). Understanding government: Four intellectual traditions in the study of public administration. *Public Administration*, 86(4), 925–949.  
<https://doi.org/10.1111/j.1467-9299.2008.00742.x>
- Reihlen, M. (1996). *The Logic of Heterarchies The Logic of Heterarchies*. 91, 20.
- Saputra, T., Zuhdi, S., Aguswan, Affrian, R., Eka, Sufi, W., & Harahap, J. R. (2023). Bibliometric Studies and Public Administration Research Potential on Stunting Problems. *Jurnal Manajemen Pelayanan Publik*, 06(02). <https://doi.org/10.24198/jmpp.v3i2.45671>
- Sikorski, C., & Bienkowska, J. (2021). *Przestrzeń organizacyjna a efektywność organizacji*. May.
- Stein, G. (2010). *Mengelola orang dan organisasi: Warisan Peter Drucker*. Emerald Group.
- Stephenson, K. (2009). Neither Hierarchy nor Network: An Argument for Heterarchy. *People & Strategy*, 32(1), 10–11.
- Susanti, E., Nurasa, H., & Widianingsih, I. (2019). Power Imbalances in Collective Decision-Making: The Study of Minimum Wage Setting Cases. *Jurnal Ilmu Sosial Dan Ilmu Politik*, 22(3), 201–215. <https://doi.org/10.22146/JSP.35997>
- Utama, Y. J., Setiyoni, B., Jamari, Tauviquirrahman, M., & Susanto, H. (2019). Bibliometric analysis of publications in the scopus database: A study at Diponegoro University during 2014–2018. *E3S Web of Conferences* 125
- W., P. W. (1990). Neither market nor hierarchy: Network forms of. *Research in Organizational Behavior*, 12(March), 295–336.
- Weber, M. (1946). *From Max Weber: Essays in sociology*. Oxford University Press.
- Widianingsih, I., Paskarina, C., Riswanda, R., & Putera, P. B. (2021). Evolutionary Study of Watershed Governance Research: A Bibliometric Analysis. *Science and Technology Libraries*, 40(4), 416–434. <https://doi.org/10.1080/0194262X.2021.1926401>