TECHNO PARK: A BIBLIOMETRIC STUDY BASED ON DATABASE GOOGLE SCHOLAR

SITI WIDHARETNO MURSALIM[1*], NINA KARLINA[2], ENTANG ADHY MUHTAR[3] and SAWITRI BUDI UTAMI[4]

[1] Doctoral students' in Public Administration, Faculty of Social and Political Sciences, Padjadjaran University, and Lecturer at Polytechnic STIA LAN Bandung, Indonesia.
[2, 3, 4] Padjadjaran University, Indonesia.
*Correspondence Author E-mail: siti21069@mail.unpad.ac.id

Abstract

This research utilised bibliometric analysis to construct and visualize studies on techno parks in Indonesia. The terms Techno Park and Indonesia were used to obtain data from the Google Scholar database, which was then visualized using the VOS viewer program. The results indicate that, over the past two decades, the number of Google Scholar-indexed publications on Techno Park research has fluctuated, with the greatest rise occurring between 2016 and 2018. In the conclusions of research conducted utilizing the publish or perish system, identified 166 articles on Techno park where mapping of the development of Techno Park research papers by author (co-authorship) revealed a link or relationship between researchers focusing on Praseya and Pae, While the keywords (co-accuracy) show the existence of a link between networks, nine clusters are also present.

Keywords: Techno Park, Google Scholar, Bibliometrik, Indonesia.

1) INTRODUCTION

According to the majority of scholars, knowledge is a crucial determinant in the long-term expansion of national and regional prosperity. The rise of regional and national economies of scale is determined by the capacity to grasp new knowledge, education, and corporate integration, as well as technical advancements (Kalenov & Kukushkin, 2018). Without these, it is impossible to have a creative economy. According to specialists from industrialized nations, one of the most successful ways to integrate an inventive economy is with a scientific techno park or a science park or a techno park that can conduct all stages of innovation, from idea generation to commercialization, in a single location. Science Techno Park (hence referred to as techno park) plays a crucial role in the expansion of start-ups, corporate initiatives, and small and medium-sized enterprises (SME) (Kyung et al., 2014). This type of techno park fosters the growth of innovation and contributes to the acceleration of distribution in a certain region.

According to Soeroso (2002) Techno Park is an area that houses research, development, and incubation facilities that eventually commercialize the discoveries. According to Rahardjo (2002), the objective of developing a techno park is to establish a partnership between science, industry (business), and the government in an effort to combine ideas, creativity, expertise, and access to capital. Therefore, Techno Park's primary mission is not limited to serving as a conduit between university, business, and government. However, techno parks also play a role in creating links between entrepreneurs and communities, which fuels the development and

commercialization of innovative technology. In other words, techno parks facilitate economic expansion and knowledge-based technology (Yuldinawati et al., 2018).

In actuality, the aforementioned items are part of the techno park, which is described above, In government-owned or university-owned techno parks, for instance, more research pertaining to techno parks can be conducted and explored in depth, In addition, research in this sector is currently relatively limited, but it is anticipated that it will serve as a reference, evaluation, and development tool for techno parks in the future.

In this research, researchers utilized Google Scholar data, where Google Scholar or Google Scholar is a provision of education service providers that enables users to satisfy their information demands by exploring scientific journals and online publications from a variety of interconnected fields. This service was introduced by Google in 2004 and is typically used by students, researchers, lecturers, academics, and even students to search for references to scientific work in scientific published journals (Nurul & Winoto, 2022).

Consequently, using bibliometric analysis, researchers will construct and visualize research on techno park on Google Scholar. Whereas this bibliometric analysis seeks to comprehend published research articles pertaining to techno parks, particularly those contained in "Technology Parks in Indonesia"

Adi (2018) argues that bibliometric analysis is applied to certain themes, fields, and research challenges using bibliometric components such as author, year of publication, journal, title, keyword, abstract, citation, h-index, co-citation, etc. Sulistyo Basuki (2002), as cited in Royani & Idhani (2018), explains that bibliometric analysis seeks to describe the textual effective communication and its characteristics, as well as the direction of descriptive development, calculation, and assessment of various communication aspects. Simply expressed, bibliometrics can explain the process and evolution of written communication in the scientific sector (Nurul & Winoto, 2022). VOSViewer is an example of a mapping tool that may be utilized to undertake bibliometric data analysis mapping (Garcia Carreño, 2020).

VOSViewer is a tool designed for constructing and visualizing bibliometric maps (van Eck & Waltman, 2017). In the area of research, Vosviewer is used to study bibliometrics, determine the most frequently cited references in specific fields, identify potential research subjects, and much more (Effendy et al., 2021). A bibliometric analysis is required to chart the progress of research on techno park on Google Scholar. This bibliometric analysis aims to identify the evolution of research publications between the years of 2002 and 2022, the direction of scientific concepts, and the network of techno parks based on co-occurring keywords and author collaboration (Co-authorship).

2) METHOD

This research utilizes a descriptive bibliometric analysis of published data on the topic of Techno Park from 2002 to 2022 that includes the keywords "Techno Park" and "Indonesia." Thus, 166 papers were gathered and evaluated based on the selected topic. In the meantime, data collection was conducted by scanning Google Scholar-indexed papers with the tool

Publish or Perish. After obtaining and storing the data in the form of a RIS file or Research Information Systems Citation File, the next step is to import the file into the Vos viewer software in order to visualize network patterns or connections among bibliometrics in three categories: network visualization, overlay visualization, and density visualization. In addition, researchers filtered phrases to be included in the network mapping visualization generated by VOS viewer.
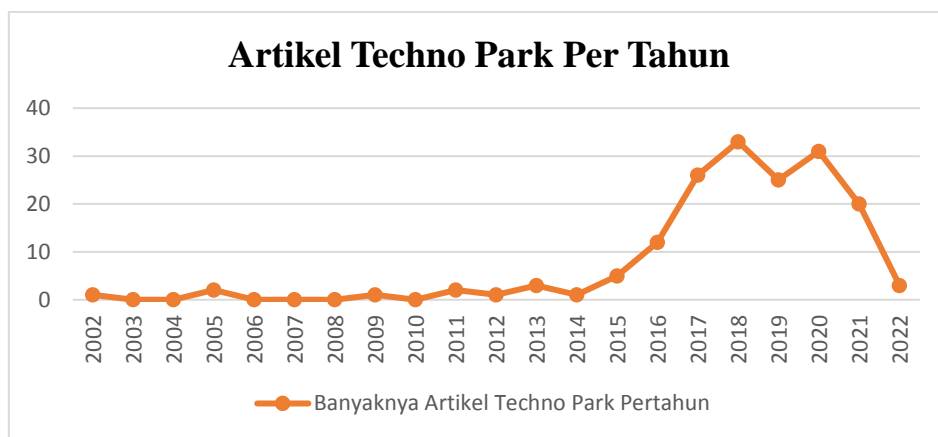
3) RESULTS AND DISCUSSION

a. Publication of Research Papers Regarding Techno Park

On the basis of a Google Scholar search for "Techno Park, Indonesia," roughly 166 research publications were found. The data pertaining to the techno park is obtained via the Publish or Perish program and then analysed in VOSViewer, where from 166 articles produced annually, the number fluctuates and has a considerable increase between 2015 and 2018.

Table 1: Publication of research findings in the area of information architecture

Publication Year	Total
2002	1
2003	0
2004	0
2005	2
2006	0
2007	0
2008	0
2009	1
2010	0
2011	2
2012	1
2013	3
2014	1
2015	5
2016	12
2017	26
2018	33
2019	25
2020	31
2021	20
2022	3
Total	**166**

Figure 1: Development graph for indexed techno park research publications Google Scholar
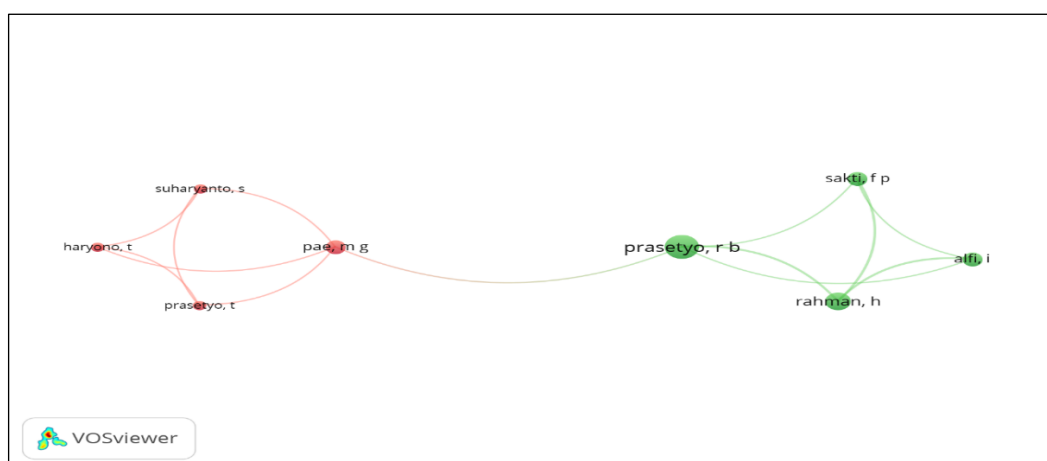

Source: Personal Information Processing Outcomes (2022)

In 2003-2004, 2006-2008, and 2010, there was no research on techno parks; presumably a new government law was implemented at that time via Law Article 14 Number 18 of 2002 pertaining to the National Research System, Development and Application of Science and Technology, as well as the absence of references pertaining to techno park research in Indonesia, are discussed (Kompasiana.com). In spite of this, the growth in the number of techno park research in recent years demonstrates that research in this sector is of interest and continues to expand annually. This is confirmed by the current number of technology parks in Indonesia.

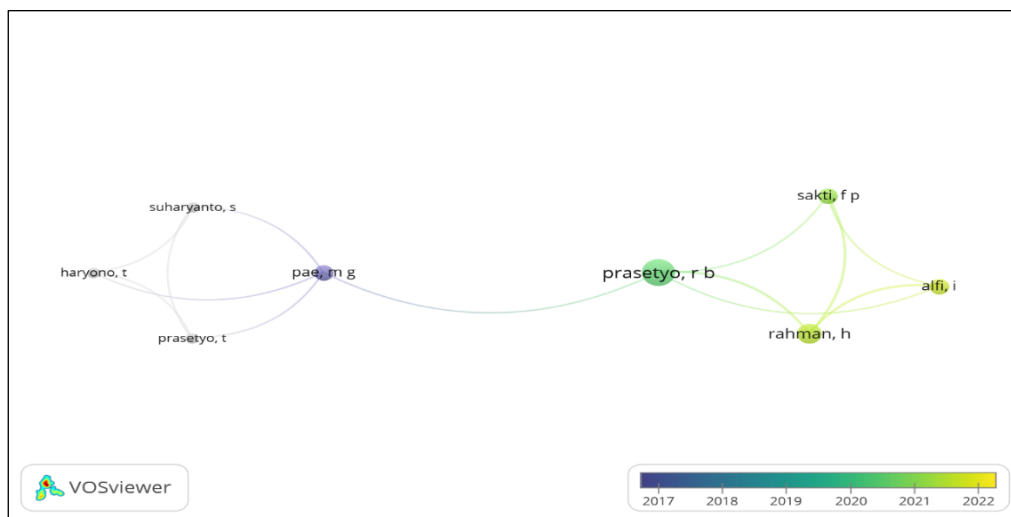**b. Development of Techno Park Research Publications by Author (Co-authorship)**

Figure 2: Network visualization on co-authorship

Source: Vosviewer (2022)

On Figure. displays a visual representation of the co-authorship network, as seen by the existence of nodes (circles) for authors or researchers and edges (networks) for relationships between authors or researchers. There is a correlation or relationship between the researchers in the Techno Park research, as indicated by the collection of nodes with edges. The relationship is separated into two clusters, the first of which includes four items (Haryono, Pae, Prasetya, and Suharyanto), and the second of which also includes four items (Alfi, Prasetyo, Rahman, and Sakti). Thus, it may be concluded that the network demonstrates a relationship or collaboration between authors, such as the network (edge) that connects Prasety and Pae as well as six additional authors, namely Prasetyo, Haryono, Suharyanto, Rahman, Alfi, and Sakti.

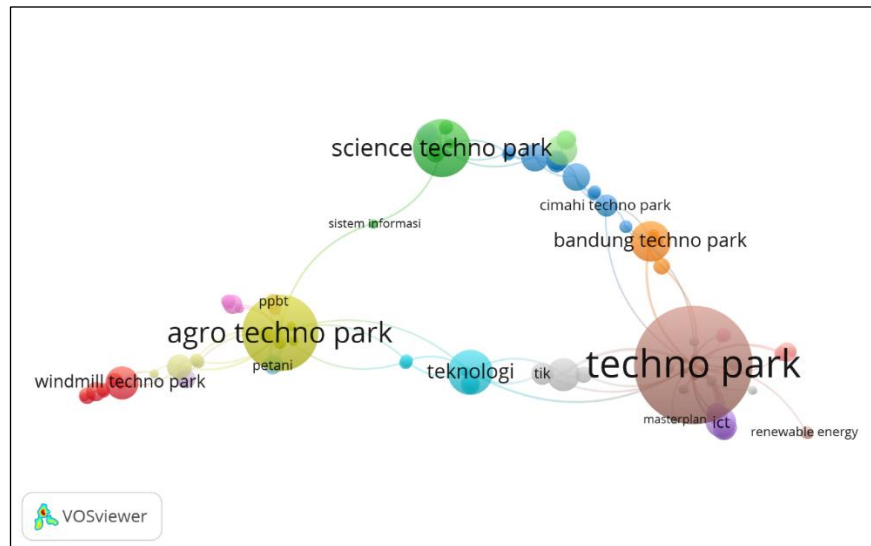**Figure 3: Overlay visualization on co-authorship**

Source: Vosviewer (2022)

In Figure 3, the author's historical footprint in research at Techno Park is depicted using an overlay visualization. This mapping is defined by the existence of nodes with varying colors and edges that connect researchers with one another. During the given time period, nodes with dark hues represent research that was conducted in the past. In the illustration, the color of the darkest node (purple) corresponds to 2017 and the color of the lightest node (yellow) corresponds to 2022.

c. Research Publication Development Roadmap for Techno Park Based on Keywords (Co- Occurrence)

Figure 5. Network visualization on co-occurrence

Source: Vosviewer (2022)

As shown in Figure 5, the results of the visualization of the co-occurrence map network for the development of research on techno parks are divided into nine clusters.

Cluster 1. The color red is comprised of twelve things, including agro science techno park, energy, energy, field trip study, gorontalo, integrated education, tourist, education tourism, potential, stakeholder analysis, vocational and technology, and windmill techno park.

Cluster 2. Warna hijau terdiri dari 11 item meliputi business feasibility, ccu, energi terbarukan, kepulauan talaud, perpustakaan, science techno park, sistem informasi, stratgey, teknologi tepat guna, dan usu.

Cluster 3. The blue color is comprised of eleven components, including Cimahi, Cimahi techno park, collaboration, Indonesia, creative industry, industry, modification, policy, quadruple helix, techno park typology, and triple helix model..

Cluster 4. The yellow color consists of eleven components, which include agro-techno park, sustainable, CCP, GMP, participation, tourism village development, economic, performance evaluation, agricultural and plantation, sustainable, and Wonosobo.

Cluster 5. There are eight components to the purple color, namely: business incubation, entrepreneurship development, ICT, information and communication, quadruple-helix, research, tourism, and tourist attraction.

Cluster 6. The color light blue is comprised of eight distinct components, including animation, high-tech, agricultural and livestock, integrated agriculture, science and techno park, technology, theme park, and upi.
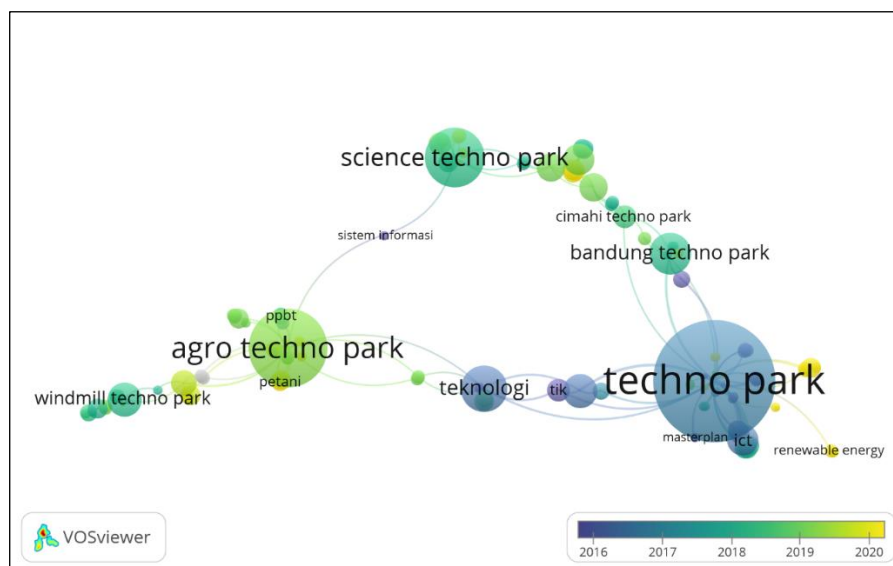
Cluster 7. The orange color is comprised of seven items: Bandung techno park, innovation ecosystem, business success, a sense of belonging, technopreneur, technopreneurship, and university.

Cluster 8. The color brown contains of seven components, including competition, electricity plants, flexsibility space, potency development, Purbalingga, techno park, dan Recreation areas.

Cluster 9. The light purple color consists of 5 items including agriculture, animal husbandary, empowerment model, patnership, dan science techno park South Sumatra.

Based on the research results shown in Figure 5, it can be concluded that the most widely used keywords in publications show the visualization of keyword research along with density maps regarding Techno Parks in Indonesia. Each cluster has a unique number of subject-related keywords. This demonstrates the diversity of the research field at Techno Park. If you look at the image above, you will notice that there are many authors who have written about the topic of techno park, but they are not connected to one another; there is no connecting line indicating that they are interrelated, similar to the co-occurrence pattern above, in which the topics are unrelated.
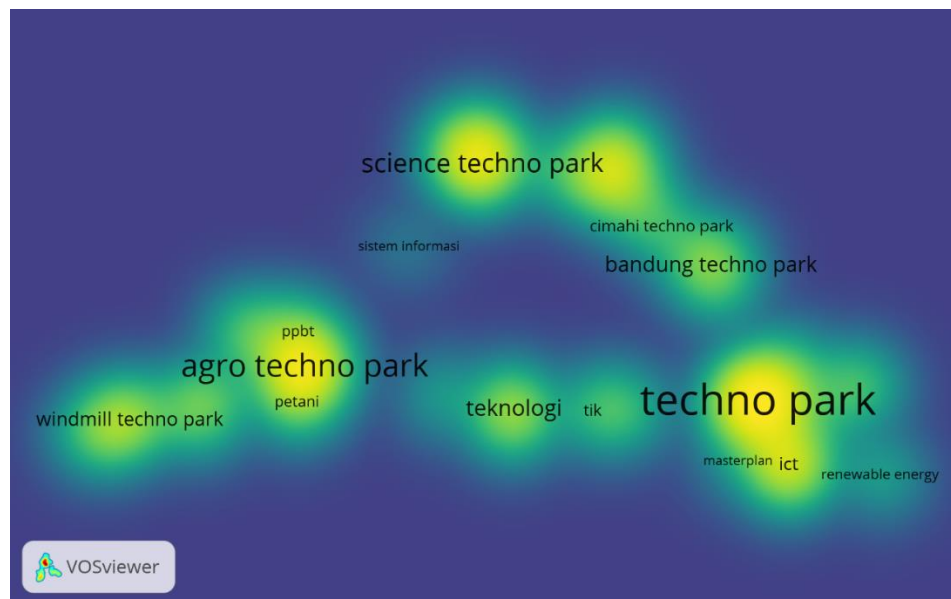
Figure 6: Overlay visualization on co-occurrence

Source: Vosviewer (2022)

Figure 6. shows In this visualization, the color of the nodes reflects keywords that identify the publication year; also, the literature overlay visualization for research on techno parks with the greatest average number of publications was generated between 2016 and 2020. On the basis of the VOSViewer visualization overlay, it can be determined that the number of articles on this topic in the annual Google Scholar database has increased since 2016.

Figure 7. Density visualization of co-occurrence

Source: Vosviewer (2022)

Figure 7. demonstrates a density map derived from an examination of all Techno Park-related papers in Google Scholar from 2002 to 2022. On the keyword density map, the frequency of occurrence increases as the circle's color and keyword density get lighter and more dense, respectively. In contrast, if the color fades and disappears into the circle's background, research will occur less frequently. From Figure 7. Additionally, it can be demonstrated that research on such collaborations in techno parks (collaboration nodes closed by the other keyword nodes) is still quite limited, which can make research on this area still extremely vast.

4) CONCLUSION

On the basis of the given results and discussion, it can be stated that VOS viewer can be utilized as a mapping tool for bibliometric data analysis. In this research, the data used to examine the data with VOS viewer are from the Google Scholar database and pertain to an Indonesian research park. During the period between 2000 and 2022, 166 publications were gathered that were linked to the topic. During this time period, the number of publications fluctuated, but from 2015 to 2018 the rate of rise accelerated. It can be shown through network visualization that the map of the development of research on techno parks is separated into nine clusters. Cluster 1 consists of 12 topics, cluster 2 consists of 11 topik, cluster 3 consists of 11 topics,

cluster 4 consists of 11 topics, cluster 5 consists of 8 topics, cluster 6 consists of 8 topics, cluster 7 consists of 7 topics, cluster 8 consists of 7 topics and cluster 9 consists of 5 topics. Despite the fact that research on and/or about techno parks in Indonesia is still very limited, it cannot be denied that this presents an opportunity for other researchers to generate additional research trends in the future.

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