JAST
Journal of Accounting Science and Technology **Vol. 5 | No. 1 | hal 21 - 45**
Post Graduate Accounting
Universitas Muhammadiyah Tangerang **e-ISSN : 2745-8652**

Mapping Systematic Topic Intellectual Capital for 2019-2024 Based on Analysis Bibliometrics

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Abstract

Study This use analysis bibliometrics For produce mapping study Intellectual Capital in a way comprehensive. Study This study change quote, trend publication, collaboration writer, title trend, say key writer trend, abstract trend, country, factor Which dominate, development study, And study period front on paper Intellectual Capital from index Scopus with range year 2019-2024. Study This use method analysis bibliometrics. Sample study Which used as much 1,145 article with say key "Intellectual Captial". Article Which used sourced from journal indexed Scopus year 2019-2024, with help Publish or Perish (PoP). Analysis bibliometrics This use VOSviewer (VV). Year with quote the most according to statistics is year 2022, with 563 quote. . The term 'Intellectual Capital ' become say key Which most Lots used in article This. Regarding publication trends, articles in 2024 show a smaller number than other years, namely only 145 journals. Article Intellectual Capital. Four country hook Not quite enough Answer Social Company with study This: 1) Taiwan, 2) China, and 3) Pakistan. Visualization network co-occurrence explain network or connection from one term to another in research in the field of Intellectual Capital for the 2019-2024 period. The visual overlay represents keywords indicating the year of publication, while the density visualization signifies study on something topic Which Still very wide For studied. Findings This Also show that important For recognize approach And theory in come back development Intellectual Capital For determine characteristic gradually from aspects that involved in inside

Keywords: Bibilometrics, intellectual capital, Scopus, Digital Library,

1. Introduction

Bibliometric analysis is a quantitative method used to describe the features of a group of published literature, such as journal articles or conference proceedings, this method involves collecting data about publications, including author, journal, year of publication, and number of citations. As well as the use of statistical techniques to analyze and interpret data (Ruangjurnal, 2020b) . Rohanda and Winoto (2019) Bibliometrics is a scientific study that has existed since the 1980s and is included in the field of library science, but over time this science can be applied and studied in all fields (Haryani & Sudin, 2020) .

Bibliometric research on issues related to Intellectual Capital is still little done. Assume that one is interested in current international developments from articles on Intellectual Capital from 2019-2024. In this case, bibliometric analysis helps in

updating the collected research. So the problem formulation for this research question is as follows:

RQ1 : What about quotes in Intellectual Capital articles for 2019-2024?
RQ2 : What are the trends in publishing Intellectual Capital articles in 2019-2024?
RQ3: How do authors collaborate on Intellectual Capital articles in 2019-2024?
RQ4: What is the trend of terms in Intellectual Capital article titles in 2019-2024?
RQ5 : What is the trend of keyword author terms in Intellectual Capital 2019-2024?
RQ6 : What is the trend of abstract terms in Intellectual Capital articles 2019-2024?
RQ7 : Which countries conduct Intellectual Capital research most frequently in 2019-2024?
RQ8 : What factors dominantly influence Intellectual Capital articles 2019-2024?
RQ9: How is the development of Intellectual Capital article research 2019-2024?
RQ10 : What will be the object of future research in the 2019-2024 Intellectual Capital articles?

2. Literature Review

2.1 Intellectual Capital

In the context of hypothesis development, the concept of Intellectual Capital (IC) plays a pivotal role in shaping research. Intellectual Capital, broadly defined as the collective knowledge, skills, and expertise of an organization's employees, is a crucial asset that drives innovation, competitive advantage, and long-term sustainability. The development of a hypothesis based on Intellectual Capital involves integrating past research and theoretical frameworks to propose meaningful relationships between intellectual resources and organizational outcomes.

Recent studies emphasize the three primary components of Intellectual Capital: Human Capital, Structural Capital, and Relational Capital. Human Capital refers to the knowledge, skills, and competencies of employees; Structural Capital refers to the organizational processes, systems, and technologies that support value creation; and Relational Capital pertains to the value derived from relationships with customers, suppliers, and other stakeholders. These components are crucial when forming hypotheses, as they can be linked to various performance metrics, such as financial performance, organizational growth, and CSR efforts.

Using the latest research in the development of hypotheses allows for the identification of gaps in existing studies, particularly the ways in which Intellectual Capital influences specific outcomes, such as CSR disclosures or profitability. This ensures that the hypothesis formed is relevant, addresses current trends, and fills the voids identified in prior literature.

Furthermore, the conceptual framework built around Intellectual Capital must include clear definitions and operationalizations of its components, linking them to measurable outcomes like innovation, competitive advantage, and organizational performance. The explanation of how each component interacts with the others in the framework enables a comprehensive understanding of how Intellectual Capital affects both tangible and intangible results within an organization.

In conclusion, the incorporation of Intellectual Capital into hypothesis development provides a robust theoretical foundation for investigating its impact on various business outcomes, filling research gaps and advancing knowledge in organizational studies.

2.2 Scopus

In the context of hypothesis development, Scopus plays a crucial role by providing access to the latest and most comprehensive research publications. The author is expected to form a hypothesis by drawing on established theories and concepts from previous research, which are

often indexed in databases like Scopus. Scopus is widely recognized for its extensive repository of peer-reviewed journals, conference papers, and other academic materials, ensuring that the hypothesis is grounded in up-to-date, high-quality research.

The use of recent research findings from Scopus is essential in ensuring the hypothesis addresses current issues, which helps close the research gap identified in the introduction. By accessing the most recent studies, an author can identify unexplored or under-researched areas, ensuring the hypothesis is relevant and contributes new knowledge to the field. This is particularly important for confirming or challenging existing theories, refining conceptual frameworks, and proposing new models.

Furthermore, the conceptual framework development is supported by Scopus, as it offers a wealth of references that guide the author in aligning the research question with existing theories. Scopus' indexing of high-impact journals allows the researcher to construct a robust framework that links the hypothesis with theory and previous empirical findings. As the researcher develops the conceptual framework, the literature from Scopus helps in explaining the relationships between variables and identifying the theoretical foundations that will support the study.

In summary, Scopus is an indispensable tool in hypothesis development and conceptual framework creation. It ensures that the hypothesis is not only aligned with the most recent research but also helps bridge the gap between theoretical knowledge and practical applications, making the research both relevant and impactful.

3. Method

The first and most important step in developing a research plan is a literature review. This means looking for and reading various books, journals and publications related to the research topic to write about it (Marzali, 2017) . Literature review is an activity that cannot be separated from research. Almost all research requires literature or literature review (Kurniati & Jailani, 2023) . To conduct a literature review, we need to plan and conduct a systematic literature search. We also need to review the relevant literature. Assess the quality and reliability of sources found, and combine search results into a comprehensive analysis (Ruangjurnal, 2020a)

3.1 Research design

The bibliometric method is a method of measuring literature using a statistical approach that includes the application of quantitative analysis (using bibliometrics: A guide to evaluating research performance with citation data", 2008) (Sidiq, 2019) . Bibliometrics comes from the words biblio or bibliography and metrics, biblio means book and meter, which is related to measuring. According to Diodato in Hartinah (2005), bibliometrics means measuring or analyzing books/literature using mathematical and statistical approaches (Haryani & Sudin, 2020) . Bibliometric analysis can be used to answer a variety of research questions, such as identifying trends in a research field, measuring the impact of a particular publication or author, or comparing the productivity of different research groups (Academia, 2023)

3.2 Research procedure

The search stage, filtering stage, bibliometric attribute examination, and bibliometric analysis are the four stages of bibliometric analysis. The research was carried out in the following stages:

3.3 Examination Procedure Stage

Currently there is a variety of software that can be used to help write scientific papers. One of them is the *Publish or Perish application,* which really helps a writer in collecting various references. The PoP application is a software program that retrieves and analyzes academic citations in the form of raw data sources, which are then analyzed and converted into various forms of citation matrices, including number of pages, total citations, and index (Khoirunnisa & Fikri, 2023) . The Scopus journal indexation process considers research methodology, editorial quality, and specific impact. Journals that are successfully indexed in Scopus are considered to have high quality and relevance in the world of research, which ensures that the information presented in them is reliable and has high credibility. With Scopus indexation, researchers, students, and practitioners can access the latest literature in various fields of study, support international collaboration, and benefit from following scientific developments around the world (Adminpj, 2024)

3.4 Bibliography Selection Stage

This is done to sort or select the journals that will be evaluated. The type of data downloaded and used is journal articles indexed by Elsevier and Emerald. In its initial search results, the PoP program produced 1,145 bibliographies. A total of 1,145 bibliographies were then selected for investigation. Several bibliography lists were not selected because they did not meet the requirements:

Table 1 Results of bibliography selection

Publication Year	Selected	Not elected	Total
2019	200	0	200
2020	200	0	200
2021	200	0	200
2022	200	0	200
2023	200	0	200
2024	145	0	145
Total	**1,145**	**0**	**1,145**

3.5 Bibliography Attribute Stage

To save files from library reference sources using the Mendeley program. Bibliographic analysis involves cross-examining and conveying bibliographic metadata. To verify the filter enter information such as author name, title, keywords, abstract, year, volume, issue number, pages, country, number of citations, link to article and publisher. Before bibliometric analysis begins, metadata must be completed

3.6 Bibliometric Analysis Stage

The identified problem formulation is used as bibliometric analysis. VOSViewer can be used to run bibliometric analysis and display the results because it is safe and efficient when dealing with very large data. VOSViewer is an important key in understanding and managing research data more efficiently (Ruangjurnal, 2020b) . VOSViewer is useful software for building and visualizing bibliometric networks (Adellia, 2023)

4. Result and Discussion

4.1 Quote Analysis

One way to measure the value of publishing scientific work in the scientific academic world is to see how many times the work is mentioned by other experts. Only in this way can scientific work be considered useful. Works mentioned or sometimes cited are the subject of debate or discussion by researchers. Citation patterns reveal a wide variety of patterns. The following are the citation results from each year taken. In 2019 there were 543 citations, 2020 (543 citations), 2021 (531 citations), 2022 (563 citations), 2023 (554 citations), and finally in 2024 there were 460 citations.

Table 2 . Citation Analysis Per Year

No	Year	Sitas
1	2019	543
2	2020	543
3	2021	531
4	2022	563
5	2023	554
6	2024	460
Total		3,194

4.2 Author Collaboration Analysis

Research is usually not carried out independently, it needs to be carried out collaboratively to get maximum results. Maximum results open up opportunities for researchers and institutions to collaborate in the form of ideas, resources and facilities, as well as various information

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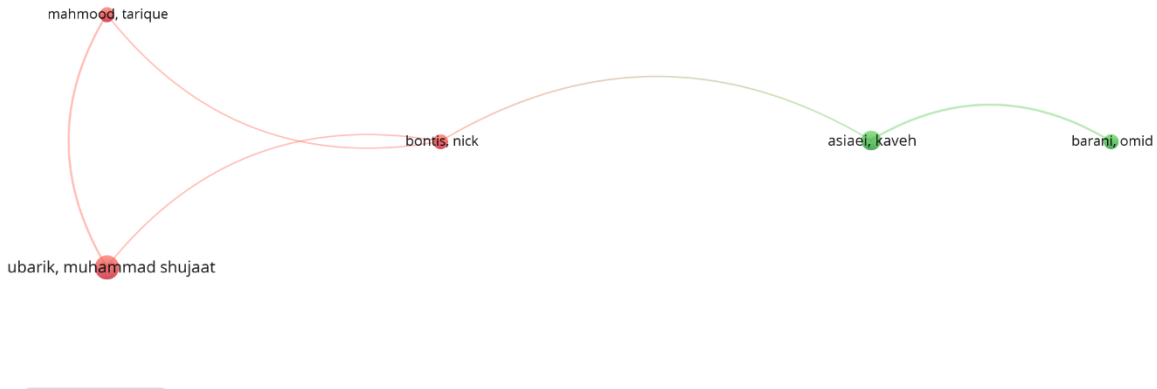

Figure 1 Author collaboration

Among the 1,283 authors in this study. Muhammad Shujaat, Mahmood Tarique, and Bontis show a strong correlation. Each author is a member of one of the network's various groups. The writer who was caught the most was Muhammad Shujaat.

4.3 Headline Term Trend Analysis

Visualization is used in bibliometric analysis to graphically present data, such as collaboration networks, citation patterns, and distribution of publications, making it easier to understand and communicate analysis results (Ariwibowo, 2023)

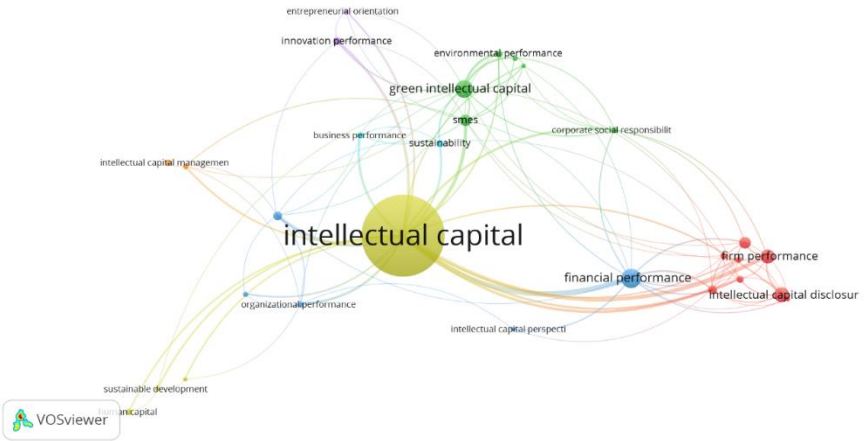

Figure 2 Headline Trend Analysis

Based on the minimum number of occurrences for each criterion, 713 findings were

deemed relevant. The word "Intellectual Capital" in the headline was most frequently used in Intellectual Capital articles with 713 occurrences.

4.4 Keyword Term Trend Analysis

The search results revealed 225 author keywords used in the selected articles. These 225 keywords are used by the author, which have strong links with at least one occurrence. The term most frequently used by the author is "Intellectual Capital" with 766 channels.

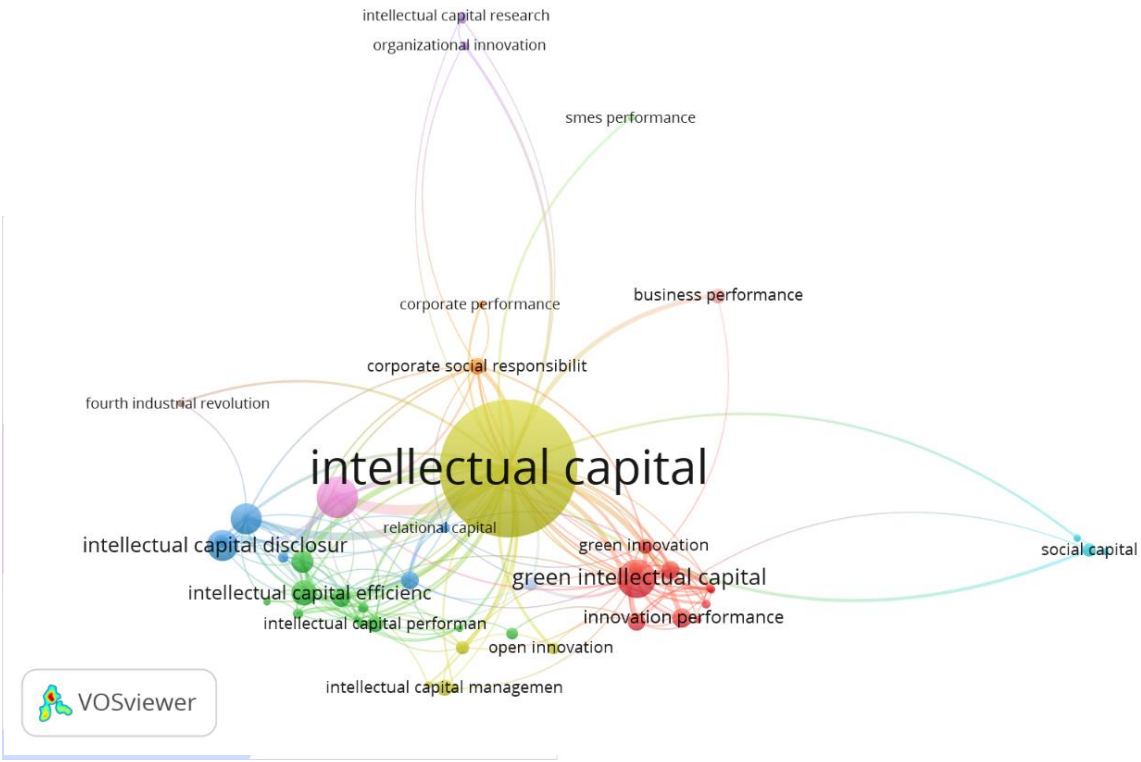

Figure 3 Visualization of the Intellectual Capital keyword network

4.5 Abstract Term Trend Analysis

Based on a study of terms frequently used in abstracts of Intellectual Capital publications, there are 3,025 terms that have a strong relationship, with analysis using a minimum number of occurrences in one phrase.

Terms that are often commonly used in abstracts with relevance between abstracts are Intellectual Capital with 713 events, Financial Performance with 87 events, and Green Intellectual Capital with 77 events. Terms that are often commonly used in abstracts with relevance between abstracts are Intellectual Capital with 713 events, Financial Performance with 87 events, and Green Intellectual Capital with 77 events.

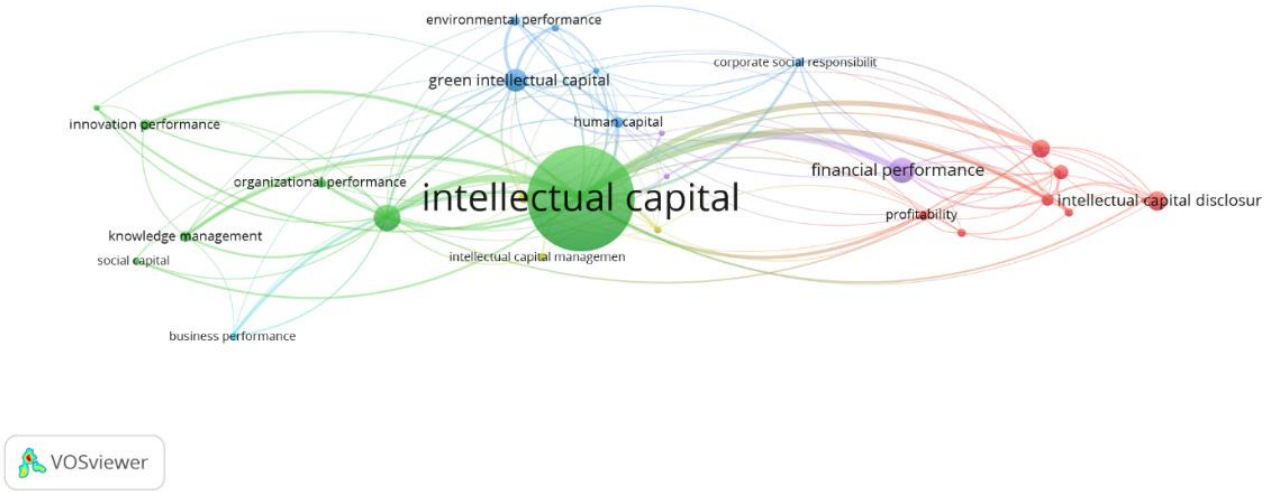

Figure 4 abstract visualization of Istirlah

4.6 Countries Most Frequently Conducting Intellectual Capital Research

Based on the search results for the title and abstract of 3,025 items, keywords were generated in the title and abstract by identifying 3 countries that have strong ties to the Intellectual Capital discussion. The thing that appears most often is China, followed by Pakistan, and finally Taiwan

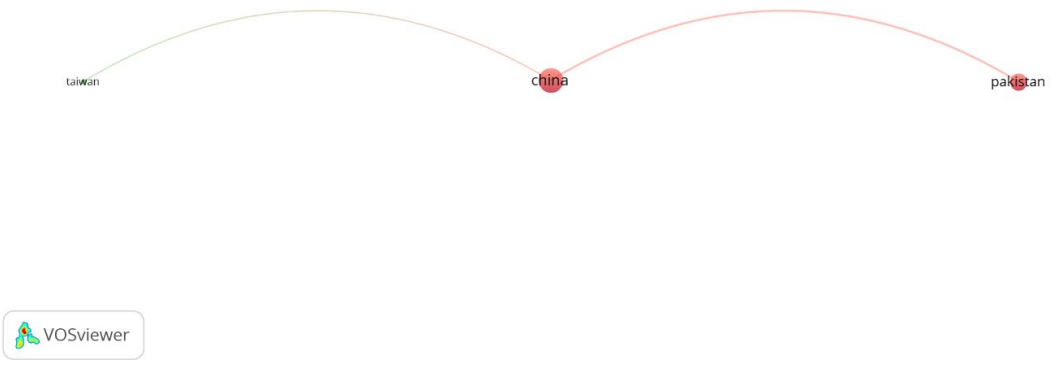

Figure 5 Visualization of countries that frequently conduct research

4.7 Analysis of Dominant Factors that Influence Intellectual Capital

At this stage, the dataset is stored in RIS *(Research Information System) form with Publish or Perish* metadata . Next, the VOSViewer application is used to analyze the dataset by selecting the data option "create map based on text data" with the aim of creating a network or relationship of terms based on text data.The field of terms is taken based on the title and abstract, while the method used to calculate the dataset is a full calculation with the aim of measuring in accordance with research related to the field of Intellectual Capital that has been carried out. The minimum number of occurrences in one term is 225 documents with occurrence relationships. Bibliometric analysis typically uses network, overlay, and density visualization to identify bibliometric networks between articles or online publications via downloaded metadata. Bibliometric networks consist of balls or circles that function as keyword representations, while *edges* or network *nodes* represent relationships between pairs *of nodes.* In bibliometric analysis, mapping and clustering in VOSViewer complement each other. The bibliometric network structure can be described using this mapping. Apart from that, grouping is also used to provide an overview or insight into bibliometric grouping.

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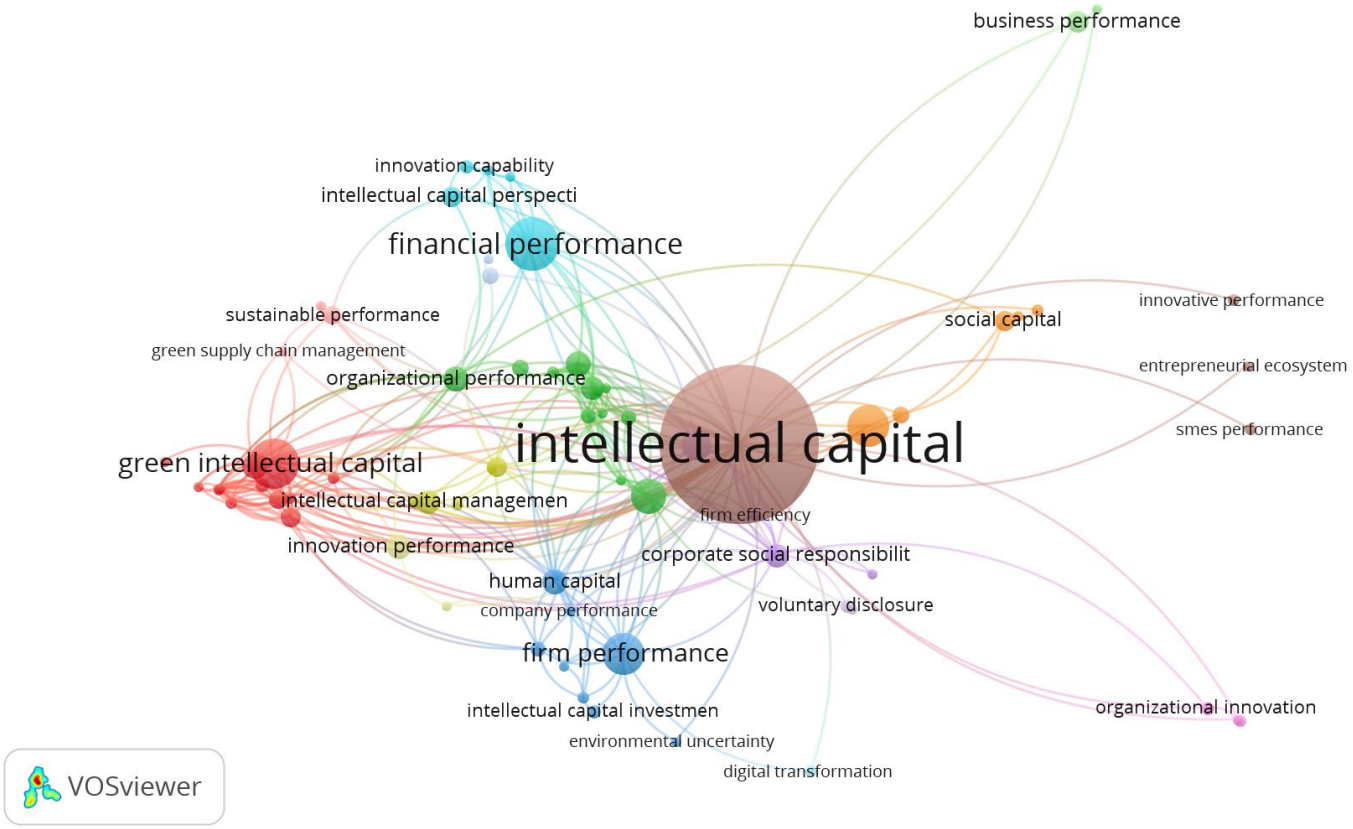

Figure 6 Visualization of concurrent networks

Figure 7 depicts a visualization of *co-occurrence networks,* explaining the network or relationship from one term to another in Intellectual Capital research for the 2019-2024 period. Of the 1,145 articles indexed by Scopus, they can be grouped into 15 clusters

Table 3. Clusters based on Co-Ocurrence

Group	Color Items	Items	Source Total	Group
Cluster-1		business strategy, business sustainability, economic performance, environmental management accounting, environmental performance, green human capital, green human resource	13	Cluster-1

Group	Color Items	Items	Source Total	Group
		management, green intellectual capital, green relational capital, green structural capital, intellectual capital components		
Cluster-2		bank performance, bank profitability, corporate sustainable growth, economic growth, human capital efficiency, intellectual capital efficiency, intellectual capital matter, intellectual capital performance, intellectual coefficient, organizational performance, profitability, structural capital efficiency	12	Cluster-2
Cluster-3		Company performance, conceptual framework, environmental uncertainty, firm performance, human capital, intellectual capital investment, relational capital, structural capital,	9	Cluster-3

Group	Color Items	Items	Source Total	Group
		sustainable growth		
Cluster-4		business model innovation, intellectual capital approach, intellectual capital management, organizational performance, organizational learning capability, sustainable development	6	Cluster-4
Cluster-5		corporate governance, corporate performance, corporate social responsibility, firm efficiency, firms intellectual capital	5	Cluster-5
Cluster-6		financial performance, good corporate governance, innovation capability, intellectual capital perspective, Islamic bank industry	5	Cluster-6
Cluster-7		cost, firm innovation, intellectual capital disclosure, mild intellectual disability, social capital	5	Cluster-7
Cluster-8		entrepreneurial ecosystem, innovative performance, intellectual	4	Cluster-8

Group	Color Items	Items	Source Total	Group
		capital, smes performance		
Cluster-9		intellectual capital development, intellectual capital research. Organizational innovation	3	Cluster-9
Cluster-10		green supply chain management, sustainable intellectual capital, sustainable performance	3	Cluster-10
Cluster-11		business performance, environmental compliance	2	Cluster-11
Cluster-12		Open innovation, intellectual impact	2	Cluster-12
Cluster-13		innovation performance, intellectual capital dimension	2	Cluster-13
Cluster-14		voluntary disclosure, intellectual capital information	2	Cluster-14
Cluster-15		digital transformation	1	Cluster-15

4.8 Analysis of Research Developments

After using network visualization to find the mapping and grouping of the Intellectual Capital field, the next step is to map and group Intellectual Capital research trends based on year or trail of research publications. To identify and identify the latest research on Intellectual Capital carried out in 2019-2024, data obtained from overlay

visualization can be used. From the results of bibliometric analysis via *Publish or Perish metadata* imported into VOSViewer, an overlay visualization is produced. In this visualization, the colors on the nodes represent keywords indicating the year of publication.

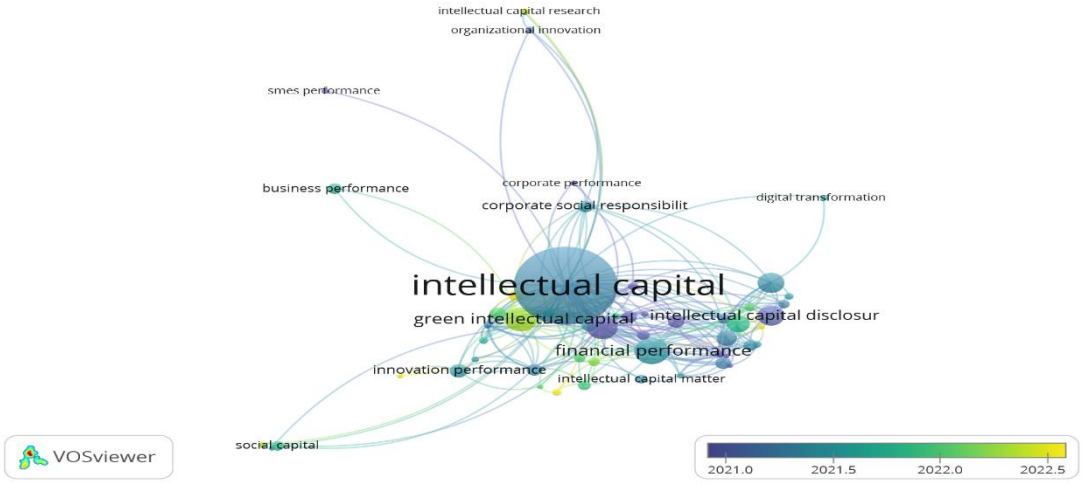

Figure 7. Overlay visualization of joint events

Table 4 Publication of Variables Based on Co-Occurence

Color Knot	Year of Publication	Items	Total Source
	2021	Bank profitability, human capital efficiency, intellectual capital performance, intellectual coefficient, relationship human capital, intellectual capital disclosure, relationship capital, intellectual capital management, organizational performance, sustainable development, corporate performance, intellectual capital, smes performance	12
	2021	corporate governance, economic growth, intellectual capital market, Islamic bank, business sustainability, green human capital, green relations capital, green structural capital, organizational performance, firm performance, firm value, intellectual capital investment, market value, sustainable competitive advantage, financial performance , corporate social responsibility, intellectual capital, development organizational innovation	18

	2022	bank performance, intellectual efficiency, environmental performance, green human resource, green intellectual capital, intellectual capital component, sustainable growth, business model innovation, open innovation, entrepreneurial leadership, intellectual capital perspective, sustainable performance, business performance, digital transformation, mild intellectual disability , social capital, innovation performance	15
	2022	financial sustainability, green innovation, innovation capability, intellectual capital research, firm innovation, high performance work system	6

Selected variables that influence “Intellectual Capital” are based on overlay visualization that occurs simultaneously, representing keywords indicating the year of publication

For example in Table 2, the words "Bank Profitability, human capital efficiency, intellectual capital performance, and others have colored dots , the articles in purple contain keywords published in 2021 to 2022. Another example is "corporate governance, economic growth, intellectual capital market" and others have colored dots, this shows that intellectual capital appears the same year, namely 2021. Then, "Bank performance, intellectual efficiency, environmental performance, green human resource", and others contain colors, namely things this means that the color will appear in 2022-2023. Then finally there is "financial sustainability, green innovation, innovation capability", and others. This variable contains a color, this means that the variable appeared in the latest year, namely 2022

4.9 Analysis of Future Research Objects

The following is a bibliometric analysis using density. From the visualization depicted in Figure 9, it can be seen that there are dense or high-density areas at one node compared to other nodes. The level of saturation identified in the number of keywords marked yellow means that the area is a topic that is widely researched and indexed by Scopus, such as the keywords Intellectual capital, effect, evidence, enterprise, innovation, green intellectual capital, firm, intellectual capital disclosure. Meanwhile, nodes marked with dark colors indicate that these topics have not yet been studied much. This can create opportunities to conduct research on these topics, namely the keywords green innovation, profitability, human capital, intellectual capital efficiency, corporate governance, intellectual capital performance. Intellectual capital with bibliometric analysis on density visualization which shows low strain and intensity, shows that research on Intellectual Capital related to these variables is relatively low, thus making studies on this topic widely researched. The following is an explanation regarding the study of these variables:

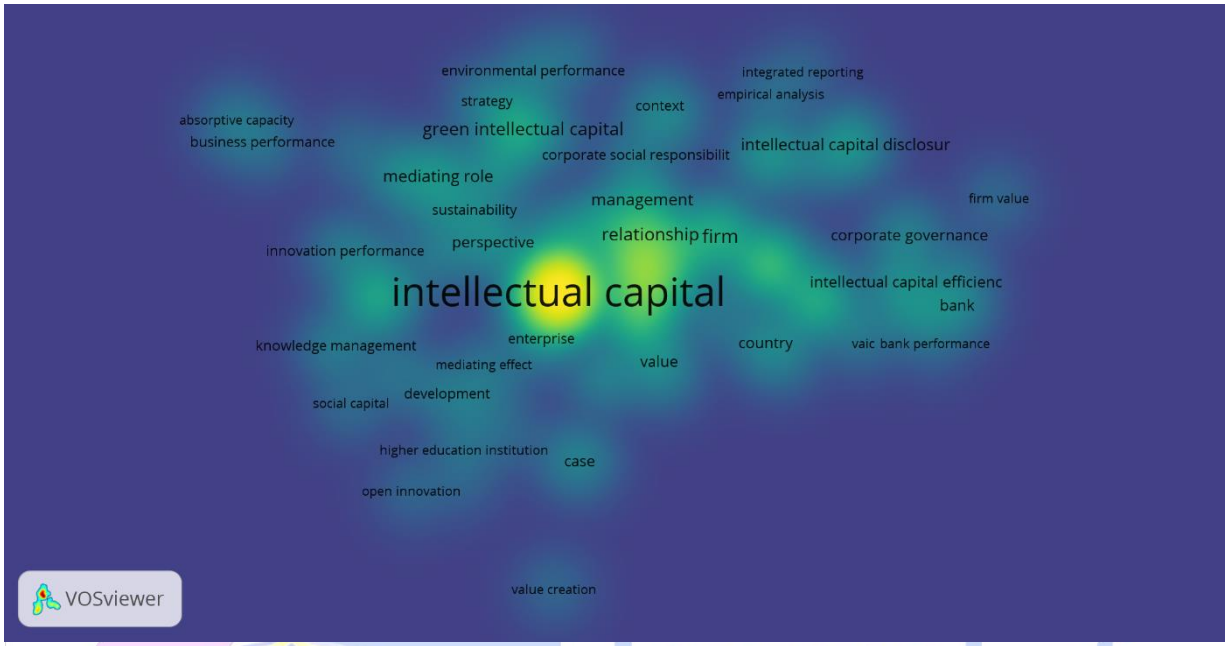

Figure 8 Simultaneous density visualization

Table 5 Variable Topics Based on Co-Occurrency which have very broad potential for research

Keywords	Year	Title	Writer	Information
Innovation Performance	2020	Knowledge sharing in supply chain networks: effects of collaborative innovation activities and capability on innovation performance	(Wang & Hu, 2020)	Elsevier Journal Journal Link Knowledge sharing in supply chain networks: Effects of collaborative innovation activities and capability on innovation performance - ScienceDirect
	2021	Unveiling the impact of the adoption of digital technologies on firms' innovation performance	(Usai et al., 2021)	Journal of Business Research Journal Link Unveiling the impact of the adoption of digital technologies on firms' innovation performance - ScienceDirect
	2021	Relationships between external knowledge, internal innovation, firms open innovation	(Shahzad et al., 2020)	International Journal of Hospitality Management Journal Link

Keywords	Year	Title	Writer	Information
		performance, service innovation and business performance in the Pakistani hotel industry		Relationships between external knowledge, internal innovation, firms' open innovation performance, service innovation and business performance in the Pakistani hotel industry - ScienceDirect
Business Performance	2020	Intellectual Capital and business performance : the role of dimensions of absorptive capacity	(Ahmed et al., 2020)	JournaL Of Intellectual Capital Intellectual capital and business performance: the role of dimensions of absorptive capacity | Emerald Insight
	2021	Supply chain integration enables resilience, flexibility, and innovation to improve business performance in the COVID-19 Era	(Siagian et al., 2021)	MDPI Journal Journal link Sustainability | Free Full-Text | Supply Chain Integration Enables Resilience, Flexibility, and Innovation to Improve Business Performance in the COVID-19 Era (mdpi.com)
	2019	Green supply chain management and business performance: The mediating roles of environmental and operational performances	(Abdallah & Al-Ghwayeen, 2020)	Business Process Management Journal Journal Link: Green supply chain management and business performance: The mediating roles of environmental and operational performances | Emerald Insight
Sustainable Development	2020	Digital Sustainability and entrepreneurship: How digital innovation is helping tackle achieve change and sustainable development	(George et al., 2021)	Sagepub Journal Journal Link Digital Sustainability and Entrepreneurship: How Digital Innovations Are Helping Tackle Climate Change and Sustainable Development (sagepub.com)

Keywords	Year	Title	Writer	Information
	2020	New challenges for corporate sustainability reporting: united nations 2030 agenda for sustainable development and the sustainable development goals	(Tsalis et al., 2020)	Journal of CSR and Environmental Management Journal Link New challenges for corporate sustainability reporting: United Nations' 2030 Agenda for sustainable development and the sustainable development goals - Tsalis - 2020 - Corporate Social Responsibility and Environmental Management - Wiley Online Library
	2021	Three pillars of sustainability in the wake of COVID-19: A systematic review and future research agenda for sustainable development	(Ranjbari et al., 2021)	Journal of Cleaner Production Journal link Three pillars of sustainability in the wake of COVID-19: A systematic review and future research agenda for sustainable development - ScienceDirect
Human Capital	2020	Human capital and AI in industry 4.0. Convergence and divergence in social entrepreneurship in Russia	(Popkova & Sergi, 2020)	Journal of Intellectual Capital Journal Link Human capital and AI in industry 4.0. Convergence and divergence in social entrepreneurship in Russia | Emerald Insight
	2020	Mitigating degradation and emissions in China: The role of environmental sustainability, human capital, and renewable energy	(Sarkodie et al., 2020)	Science of the Total Environment Journal Link Mitigating degradation and emissions in China: The role of environmental sustainability, human capital and renewable energy - ScienceDirect
	2021	Do natural resources	(Rahim et al., 2021)	Resources, Environment, and Sustainability

Keywords	Year	Title	Writer	Information
		abundance and human capital development promote economic growth? A study on the resource curse hypothesis in next eleven countries		Journal link Do natural resources abundance and human capital development promote economic growth? A study on the resource curse hypothesis in Next Eleven countries - ScienceDirect
Firm Performance	2021	Artificial intelligence capability: Conceptualization, measurement, calibration, and empirical study on its impact on organizational creativity and firm performance	(Mikalef & Gupta, 2021)	Information and Management Journal Link Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance - ScienceDirect
	2021	Environmental, social and Governance activity and firm performance: a review and consolidation	(Duque-Grisales & Aguilera-Caracuel, 2021)	Accounting & Finance Journal Link Environmental, social and governance (ESG) activity and firm performance: a review and consolidation (wiley.com)
	2020	ESG Disclosure and firm performance before and after IR: The moderating role of governance mechanisms	(Albitar et al., 2020)	International Journal of Accounting & Information Management Journal Link: ESG disclosure and firm performance before and after IR: The moderating role of governance mechanisms | Emerald Insight
Green Innovation	2020	Green Innovation and Environmental performance: The role of green transformational leadership and green human	(Singh et al., 2020)	Technological Forecasting and Social Change Journal Link Green innovation and environmental performance: The role of

Keywords	Year	Title	Writer	Information
		resource management		green transformational leadership and green human resource management - ScienceDirect
	2021	Analyzing the relationship between green innovation and environmental performance in large manufacturing firms	(Rehman et al., 2021)	Technological Forecasting and Social Change Journal Link Analyzing the relationship between green innovation and environmental performance in large manufacturing firms - ScienceDirect
	2020	Relation of environmental sustainability to CSR and green innovation: A case of Pakistani Manufacturing Industry	(Shahzad et al., 2020)	Journal of Cleaner Production Journal Link Relation of environmental sustainability to CSR and green innovation: A case of Pakistani manufacturing industry - ScienceDirect
Financial Performance	2021	Environmental, Social and Governance (ESG) scores and financial performance of multinationals: Moderating effects of geographic international diversification and financial slack	(Duque-Grisales & Aguilera-Caracuel, 2021)	Journal of Business Ethics Journal Link Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack | Journal of Business Ethics (springer.com)
	2020	On the relationship between corporate social responsibility and financial performance	(Awaysheh et al., 2020)	Strategic management journal Journal link On the relationship between corporate social responsibility and financial performance - Awaysheh - 2020 - Strategic Management

Keywords	Year	Title	Writer	Information
				Journal - Wiley Online Library
	2020	Exploring financial performance and green logistics management practices: Examining the mediating influences of market, environmental and social performance	(Agyabeng-Mensah et al., 2020)	Journal of Cleanser Production Journal link Exploring financial performance and green logistics management practices: Examining the mediating influences of market, environmental and social performances - ScienceDirect

Note: the selected variables that influence "Intellectual Capital" are based on visualization of co-occurring densities, representing research with a topic that is still very broad to be studied

Based on table 5, several keyword variables can be described which shows that research on Intellectual Capital related to these variables is still relatively low, thus making studies on this topic can be researched widely. Following are several explanations regarding the study of these variables. First, *the Innovation Performance variable* , discussion of the relationship of this variable to Intellectual Capital can refer to Changfeng Wang, et al (2020), A Usai, et al (2021), and Wassem et al (2021). Second, namely the *Business Performance variable,* Syad Saad et al (2020), Hotlan, et al (2021), and Ayman Bahjat, et al (2019). Third, there is the *Sustainable Development variable,* Gerard Goerge, et al (2020), Thomas, et al (2020), and Meisam, et al (2021). Fourth, there is the *Human Capital variable,* Elena et al (2020), Samuel, et al (2020), and Syed Rahim, et al (2021). Fifth, there is *the Firm Performance* variable , Patrick et al (2021), Danny Z, et al (2021), and Khaldoon, et al (2020). Sixth, there is the *Green Innovation variable,* Sanjay Kumat, et al (2020), Shafique, et al (2021), and Mohsin, et al (2020). Then the seventh is the *Financial Performance variable,* Eduardo, et al (2021), Amrou, et al (2020), and Yaw Agyabeng, et al (2020)

4.10 Future Research Objects

Based on the visualization results, Innovation Performance, Business Performance, Sustainable Development, Human Capital, Firm Performance, Green Innovation and Financial Performance are variables that are still slightly correlated with Intellectual Capital. This is reinforced by the visualization in Figure 10 which is characterized by the small number of nodes in each variable.

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Journal of Accounting Science and Technology **Vol. 5 | No. 1 | hal 21 - 45**
Post Graduate Accounting
Universitas Muhammadiyah Tangerang **e-ISSN : 2745-8652**

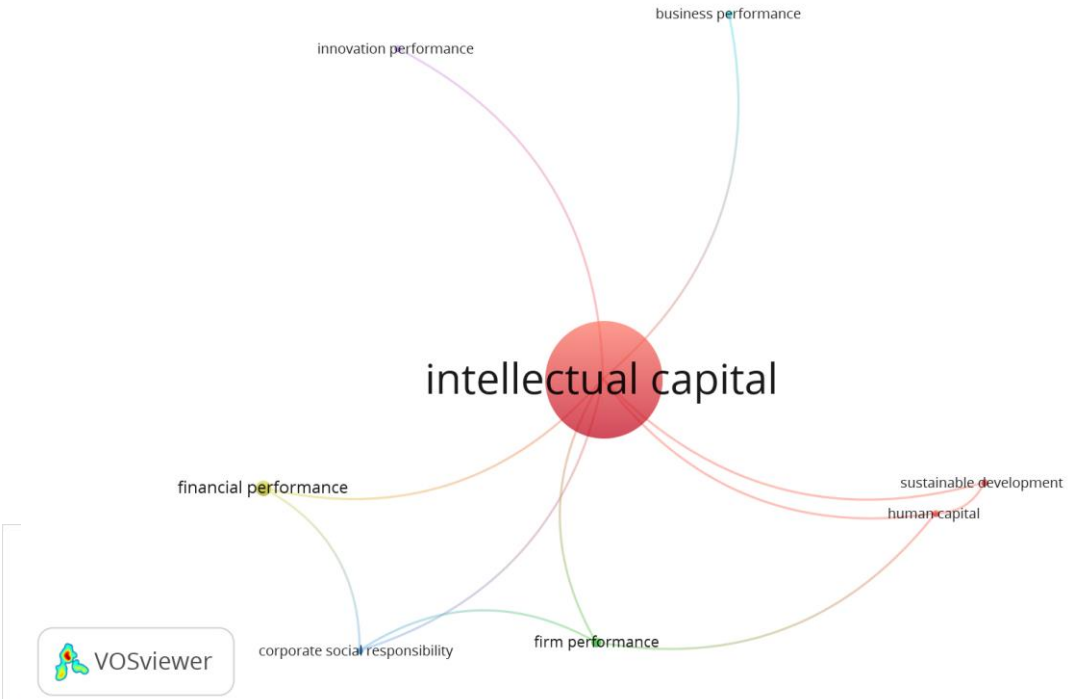

Figure 9 Visualization of Further Research Objects

5. Conclusion

Quantitative descriptive research is presented in bibliometric research. Therefore, this research can only provide a general overview of how research on Intellectual Capital works. In order to better bibliometric objectives and results, the inclusion and exclusion criteria and the quality of the research included in the review must be strict. Based on citation analysis, there were increases and decreases in citations in Intellectual Capital publications from 2019 to 2024. The increase occurred in 2022 where the number was greater than 2019 to 2021. And the lowest citations were in 2024 because it was still a new year, and there are still many who are doing further research related to intellectual capital.

The author's involvement in articles related to Intellectual Capital is considered sufficient. Among the 1,283 authors in this study, Muhammad Shujaat, Mahmood Tarique and Bontis showed a strong correlation. Intellectual Capital is the phrase in the title that appears the most in this publication, with 713 occurrences. The term Intellectual Capital is the most commonly used keyword in this article. There are 3,025 occurrences of terms related to Intellectual Capital. Apart from that, there are three countries that link Intellectual Capital to this research, namely Taiwan, China and Pakistan

Co-occurrence network visualization explains the network or relationship of terms to other terms in research in the field of Intellectual Capital for the 2019-2024 period, which can be grouped into fifteen identified clusters, based on the color of each keyword node. Cluster-1 with 13 sources, Cluster-2 with 12 sources, cluster-3 with 9 sources, cluster-4 with 6 sources, cluster-5 with 5 sources, cluster-6 with 5 sources, cluster-7 with 5 sources, cluster -8 with 4

sources, cluster-9 with 3 sources, cluster-10 with 3 sources, cluster-11 with 2 sources, cluster-12 with 2 sources, cluster-13 with 2 sources, cluster-14 with 2 sources, and so on finally cluster-15 with 1 source.

In addition, mapping and grouping Intellectual Capital research trends is based on historical traces or years of research publication. The information obtained from the overlay visualization results can later be used as a reference for identifying and detecting the state of the art from research in the field of Intellectual Capital carried out in the 2019-2024 period. The overlay visualization results revealed 51 sources to be used as keywords related to Intellectual Capital. In 2021 there are 12 sources that can be used as keywords related to Intellectual Capital, in the same year, namely 2021, there are also 18 sources that can be used as keywords related to Intellectual Capital, in 2022 there are 15 sources, and in the same year, namely 2022 produces 6 sources that can be used as Intellectual Capital keywords.

Furthermore, density visualization can identify areas of or density at one node with other nodes. The level of saturation identified in the number of keywords marked yellow means that the area is a topic that is widely researched and indexed by Scopus, such as financial sustainability, firm innovation, innovation capability, and high performance work systems. In comparison, points marked in dark color indicate that these topics have not yet been widely studied. This can create opportunities to conduct research on these topics, namely Innovation Performance, Business Performance, Sustainable Development, Human Capital, Firm Performance, Green Innovation, and Financial Performance . With analysis using bibliometrics on density visualization which shows low strain and intensity, it means that research on Intellectual Capital related to these variables is still relatively low. In other words, this makes the study of this topic still very broad and needs further scrutiny

The limitation of this research is that it only uses observation years starting from 2019. Therefore, future researchers should add more articles from the latest year. Apart from that, this research has not explored the application of the literature used. Future researchers are advised to develop this literature review with other assistance such as Biblioshiny or R

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