

## Emerging Trends in Intellectual Capital Research: A Decade Review

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### Abstract

This study aims to analyze the trends in intellectual capital research by reviewing articles published on scopus.com. The objective is to identify the patterns of development and anticipate the future directions of intellectual capital research that are important for academics and practitioners in this field. The method used is a combination of bibliometric analysis and descriptive analysis with 132 articles based on the keyword search "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital". There has been a significant increase in the number of articles related to intellectual capital over the years, indicating a growing interest. These topics have interdisciplinary relevance and are researched in various fields including management, economics, finance, technology, and sustainability. This study is limited to articles published in journals listed in scopus and may not cover perspectives or trends in other journals or among industry practitioners. The originality of this research provides a comprehensive understanding of the current trends in intellectual capital research and identifies the future directions of research in this field. It adds value to academics and practitioners who want to understand the evolution and application of intellectual capital in the business and academic context.

Keywords: intellectual capital, systematic literature review, bibliometric analysis, VOSviewer, VAIC, structural capital, relational capital, human capital.

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### INTRODUCTION

This study aims to review articles published in scopus-indexed journals as a way to depict the patterns of past and future development of these recognized outlets. Given the importance of journals in the research landscape, particularly for intellectual capital research, we hope that the findings of our study will be useful for intellectual capital academics, who seek to discover and explore gaps in the research domain, as well as for practitioners, who want to enhance their knowledge on this topic.

Since the concept of intellectual capital was introduced by (de Matos Pedro, Leitão, & Alves, 2020), academics have emphasized its usefulness for the survival and growth of companies, performance, competitiveness, and innovation (Vafaei, Taylor, & Ahmed, 2011). Despite the abundant attention to this topic over time, the concept and impact of IC still remain vague or difficult to grasp (Faraji, Asiaei, Rezaei, Bontis, & Dolatzare, 2022).

(Lindblom, Mallios, & Sjögren, 2023) In fact, IC proves itself as a highly versatile, dynamic, and contemporary concept, capable of increasing academic interest that grows every year and renewing itself. This trend is well reflected through the publications that have emerged in JIC within the studied time range (Matos, Vairinhos, & Cabrita, 2016)(Ahmed, Buallay, & Wadi, 2023)(Bontis & Fitz-enz, 2002).

Intellectual Capital (IC) is a critical capacity in managing knowledge-based intelligence through the understanding of symbolic meanings (Pujotomo, Syed Hassan, Ma'aram, & Sutopo, 2023), while also closely related to the concept of a learning organization. This construct refers to the combination of knowledge and experience that enhances the wealth of a company. Thus, IC emerges from the process of creating organizational knowledge that strives to compete through continuous improvement.

IC is an intangible component, a form of tacit knowledge, that contributes the most to the process of creating company wealth (Beattie & Smith, 2013) and can be divided into five sub-dimensions: human capital, structural capital, organizational capital, process capital, and customer capital or social capital (Sgourev, 2023). The significant success and importance of this topic are also supported by the numerous existing literature reviews (Ahmed et al., 2023), (Ulupui, Gurendrawati, Armeliza, & Murdayanti, 2023), (Thien & Hung, 2023).

Scopus, created by Elsevier, is a globally recognized database for scientific references and citations, covering various fields such as science, technology, medicine, and humanities. It provides advanced search facilities for research and scholarly sources, including journals, conferences, and books. The database also offers analytical tools such as citation calculations and the h-index to evaluate the impact of scientific works. Scopus adopts a rigorous selection process to include only high-quality works, as well as assisting researchers in collaboration and monitoring the latest developments in their fields. Scopus is widely used by researchers, academics, and professionals in various fields for research purposes, academic development, and scientific performance assessment.

## **METHOD**

This Research Methodology is specifically designed to answer the question of how the publication development in Scopus aligns with the increase in publications, particularly on the topic of intellectual capital. To achieve this goal, we integrate two different analysis methods, namely bibliometric method and descriptive analysis. The research sample includes the entire population of 132 papers published in Scopus-indexed journals from 2007 to 2024.

The first step is to search for metadata through ScienceDirect.

1. Searching for metadata in ScienceDirect using the address <https://www.scopus.com> by entering the keywords: "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital". Metadata in bibliometric analysis plays a vital role as it will affect the quality of mapping.

2. Based on the search results of metadata through ScienceDirect, 132 documents related to the keywords "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital" were found.

3. These 132 documents are referred to as metadata and are exported as needed by clicking RIS export on <https://www.scopus.com>, and the metadata in CSV excel format is named scopus.csv.

The second step is to perform bibliometric analysis using VOSviewer. VOSviewer is one of the bibliometric applications for bibliometric mapping of a publication, allowing us to see how the links between one publication and other publications. The steps to perform bibliometric analysis are as follows:

1. Select create in the menu in the VOSviewer application, then create a map by selecting Scopus files, adjusting the metadata we have.

2. Next, select the type of analysis, including co-occurrence, all keywords, fractional counting in the Choose type of analysis and counting method menu.

3. The choice of the number of keywords processed by VOSviewer is three keywords, and it is found that there are 44 keywords that appear simultaneously in an article.

4. Display the analysis results by selecting three types of views: (1) network visualization, (2) overlay visualization, (3) density visualization.

## RESULT AND DISCUSSION

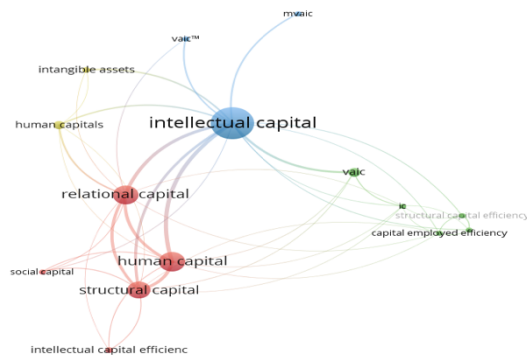


Figure 1. Network Visualization Display

Bibliometric analysis (Ulupui et al., 2023) related to the use of Network Visualization technique (Figure 1 display) to map and understand the interrelationships between various keywords "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital" in the research context. These keywords are important concepts in the field of management and economics, particularly related to the assessment and management of intangible assets or 'intellectual capital' in an organization.

Network Visualization in this context reveals how various aspects and evaluations of 'intellectual capital' are interconnected in research literature, highlighting key areas and how they interact with each other in the research domain (Sgourev, 2023). Based on Figure 1, it can be explained as follows:

1. First Cluster (5 items): Includes "human capital," "intellectual capital efficiency," "relational capital," "social capital," "structural capital." This group indicates the interrelationships between aspects of human capital, intellectual capital efficiency, relational capital, social capital, and structural capital. It indicates a close relationship between these components in the context of efficiency and implementation of intellectual capital.
2. Second Cluster (5 items): Consists of "capital employed efficiency," "human capital efficiency," "intellectual capital," "structural capital efficiency," "VAIC." This group focuses more on efficiency aspects - how human capital and structural capital are organized and used efficiently, as well as their relationship with overall intellectual value added.
3. Third Cluster (3 items): Contains "intellectual capital", "MVAIC", "VAICTM". This indicates a specific focus on the concepts of intellectual capital

assessment, including MVAIC (Modified Value Added Intellectual Coefficient) and VAICTM.

4. Fourth Cluster (2 items): Contains "human capital" and "intangible assets". This group seems to examine the direct relationship between human capital and intangible assets more broadly.

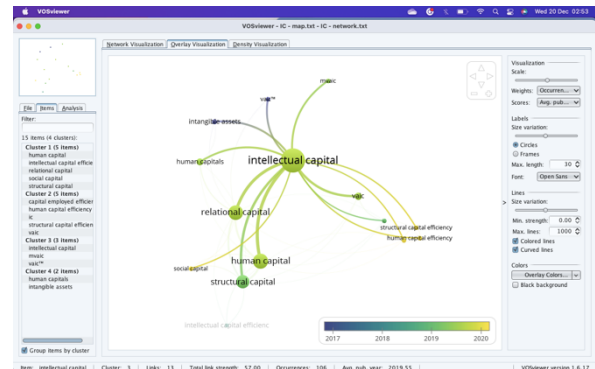


Figure 2. Overlay Visualization Display

The next display, Figure 2, is an overlay visualization, which is a type of visualization in bibliometric analysis used to map and display data. In this context, the visualization is used to show the frequency of keyword occurrences in Scopus-indexed journals from 2007 to 2024. This overlay visualization identifies trends or dominant topics in a specific research field at that time.

Overlay visualization helps us understand how the concept of intellectual capital is discussed in academic literature and how the discussion has evolved over time. The term "intellectual capital" is the main focus, marked by its central position and frequent appearance in related research. Terms such as "human capital," "relational capital," and "structural capital" are often associated and may closely correlate with "intellectual capital." Other keywords such as "social capital" and "intangible assets" may represent specific areas of intellectual capital. A timeline shows the recent frequency and relevance of these keywords, with newer ones displayed brighter. This visualization also reveals trends and relationships between concepts, with thicker lines indicating stronger connections.

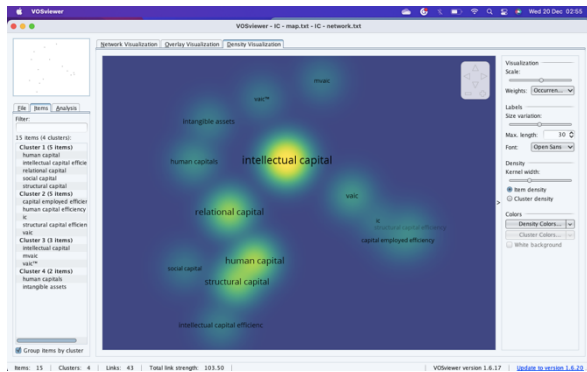


Figure 3. Density Visualization

The last visualization is Density Visualization, which shows the distribution of topics in bibliometrics by the frequency of keyword occurrences in Scopus-indexed journals. "Intellectual capital" appears as the main theme with the brightest color, indicating its prominence and frequency in the data. Other keywords such as "human capital," "relational capital," and "structural capital" are also prominently visible, indicating their close relationship with the main theme. Brighter colors indicate more recently discussed topics, while darker colors mark lower frequencies. The color gradient represents the intensity of discussion, with yellow symbolizing the hottest topics. This visualization is useful for observing research trends and the relationships between topics in the field of intellectual capital.

Trend of articles published in ScienceDirect at <https://www.scopus.com> by entering the keywords: "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital".

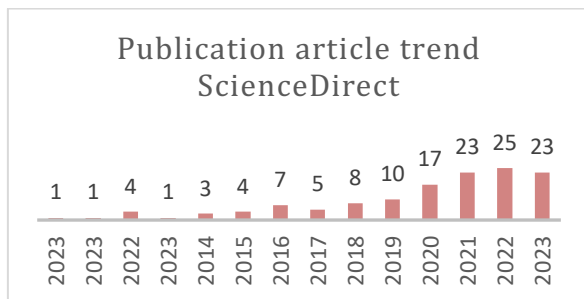


Figure 4. Trend of Article Publications in ScienceDirect

The data shows a significant development in the number of articles on "intellectual capital," "VAIC," "structural capital," "relational capital," and "human capital" from 2007 to 2023. There were very few initial publications in 2007 and 2010, only one article. However, there has been a noticeable increase since 2012, with four articles, and this trend continues to rise each year. 2016 was an important turning point with

the publication of seven articles, indicating a growing interest. From 2017 to 2023, there was a significant surge, peaking in 2022 with 25 articles. Although there was a decrease to 23 articles in 2023, the interest in this topic remains high, reflecting a consistent upward trend in research and publication, indicating the importance of this topic in the academic and practical world.

The increased interest in this research is due to several factors. The economic transformation towards the knowledge era has made companies and organizations recognize the importance of non-physical assets. Innovation and creativity are the main drivers of growth, and research on intellectual capital helps manage innovative ideas. Research in the field of human capital, structural capital, and relational capital is important for human resource development, improving efficiency, and building valuable external relationships. This research also aids in decision-making, promotes sustainable growth, builds competitive advantages, and supports social and economic well-being.

Articles with the keywords "intellectual capital" and "VAIC" and "structural capital" and "relational capital" and "human capital" published in 76 journals have the following distribution:

1. Generally, journals only have one article that includes all of these keywords.
2. Some journals have more than one article, such as "Economies" with 2 articles and "Intangible Capital" also with 2 articles;
3. "International Journal of Learning and Intellectual Capital" has 15 articles, indicating a strong focus on the topic in the journal.
4. "Journal of Intellectual Capital" stands out with 25 articles, indicating that this may be a major research center for the topic of intellectual capital.
5. "Sustainability (Switzerland)" has 7 articles, indicating that the topic is also relevant in the context of sustainability.
6. "Mathematical Problems in Engineering" and "Proceedings of the European Conference on Knowledge Management, ECKM" each have 3 articles, indicating a connection between this topic and the fields of engineering and knowledge management.

The analysis of the data can provide insights into trends and focuses in research related to "intellectual capital," "VAIC," "structural capital," "relational capital," and "human capital." The number of articles spread across various journals indicates that this topic has interdisciplinary relevance and is researched in various

fields, including management, economics, finance, technology, and sustainability.

Journals with a larger number of publications on this topic, such as "Journal of Intellectual Capital" and "International Journal of Learning and Intellectual Capital," may be major centers for research in this area (Secundo, Lombardi, & Dumay, 2017). The high number of publications indicates that these journals may have readers interested in the topic, with 1647 citations for the Journal of Intellectual Capital and 193 citations for the International Journal of Learning and Intellectual Capital. Additionally, these journals have editorial boards that value research in this area.

The abundance of articles that cover all five keywords indicates a significant interest in exploring the relationship between various aspects of intellectual capital. This may reflect a trend in research that recognizes the importance of integrating various forms of capital to understand the full value of intellectual assets in organizations.

Research is not only focused on theoretical (Sgourev, 2023) or conceptual fields but also applied, as shown by journals focusing on technology, sustainability, and engineering, such as the Information Technology Journal with the article title "Research of the effectiveness of the growth of sines under intellectual capital driven-based on the empirical analysis of smes in China listed companies." This indicates that these concepts are seen as critical in addressing practical and strategic challenges in various sectors.

The journal "Sustainability (Switzerland)" has seven related articles, indicating that intellectual capital is considered important in discussions about sustainability. This may reflect recognition that human, structural, and relational capital play a role in achieving sustainability goals.

The high number of articles in the "Journal of Intellectual Capital" and involvement in conferences on knowledge management indicate that this research is highly relevant to organizational development and innovation. The number of journals from various countries and disciplines indicates that research on intellectual capital has broad appeal and is globally recognized as an important field.

## CONCLUSION

Conclusion:

1. Intellectual capital has proven to be a dynamic and relevant research field, with a significant increase in interest and publications.

2. This research provides valuable insights into the future direction and trends in intellectual capital research, covering both theoretical and applied aspects.

## Recommendations

1. Scholars and practitioners should pay attention to the thematic evolution of intellectual capital, given its ongoing relevance in various sectors.
2. Further research can focus on integrating various forms of intellectual capital to understand the full value of intellectual assets in organizations.
3. There needs to be an emphasis on the practical application of intellectual capital concepts in addressing strategic challenges in various sectors, including technology and sustainability.

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