

# **HUMAN CAPITAL MANAGEMENT: A BIBLIOMETRIC ANALYSIS USING VISUALIZING SCIENTIFIC LANDSCAPES**

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## **ABSTRACT**

An organization can be considered a social system that focuses on both the financial and societal components of the company as well as the values and needs of the individual employees involved. The foundation of any firm is its workforce. Without a strong and productive workforce, no company can thrive. Hence, human capital can play a significant role in increasing the productive capacity and revenue of the organization. With practice, engagement, training, and other factors, every individual develops a specific combination of abilities for their position, which ultimately boosts their productivity as well as assists in the growth of business. Human capital refers to the knowledge and skills that people acquire over time to further boost the operational efficiency of enterprises. Hence, human capital management practices can play a significant and essential role in the level of achievement of workers; expertise and ability are developed, and instruction and training can bring confidence and morale. Human capital management procedures and workers productivity have a strong positive correlation with one another. This has drawn the attention of the researchers. The rapid development of research documents on human capital management necessitates a thorough analysis of the literature in the field. The present paper aims to investigate the literature on human capital management using bibliometric analysis. A Dimension database is used for this purpose. Around 813 documents, including articles, edited books, chapters, and proceedings, were retrieved from Dimension and used to conduct the study. The research makes an effort to address a few important questions such as productivity analysis, co-citation analysis, and co-occurrence analysis, which offer informative data on top-cited documents, authors, annual publications, and organizations that are contributing to the field of human capital management using VOS Viewer software. The analysis shows that since 2015, there have been more research papers published on the subject of human capital management. And research interest in HCM was at its peak in 2022. Cahyaningish, E. (12 articles), and Sensuse, D.I. (12 articles), rank top in publishing articles between 2005 and 2022. The Impact of Organizational Context and Information Technology on Employee Knowledge-sharing Capabilities was the most-cited

document. These findings may aid future researchers in laying a solid foundation before beginning a study on human capital management and in knowing the research gap.

**Keywords:** *Human capital management, Human resource management, knowledge, productivity*

## 1. INTRODUCTION

In the current world scenario, organizations face different hindrances across all industries. For any company to be productive, it must draw in and retain highly qualified staff and have dependable workers committed to carrying out the responsibilities within the stipulated time (Rahmawati et al., 2016). Hence, the most valuable resource in a corporate entity is its employees, or, in other words, human capital. Becker developed the concept of human capital in his economics literature "The Economic Way of Looking at Behavior". He believes that financial capital, physical capital, and human capital are different forms of capital, and this difference arises from the fact that individuals can be distinguished from their possessions and properties but not from their talent, well-being, and ideals. Human capital is therefore the most environmentally friendly and degradable form of capital.

The fundamental source of productivity in a society and the cornerstone of management theory is the human resource. Together with financial or industrial means, education, talents, professional abilities, experience, and individual initiative are very important in today's world. An employee with high competence, cognitive ability, and creative ability is the key component in the growth and development of any organization (Souleh, 2014). Herein lies the importance of human capital management. Kearns (2005) defined the concept of human capital management as "the total development of human potential expressed as organizational value". Knowledge management and competency management are essential components of human capital management (Souleh, 2014). A company is a quantifiable human ability needed for successful performance. Knowledge, a particular skill or capability, an individual characteristic, or a combination of two or more such elements can be included in the basic definition of competency (Marrelli et al., 2005). CM, or competence management, is defined as a procedure that starts with an organization's goal, approach, and target (Sydamaalakka, 2000). Knowledge management, on the other hand, is defined as a process related to the creation, acquisition, arrangement, exploiting, distribution, and use of knowledge. That is, it is the precise and methodological management of essential knowledge. Personal knowledge must be transformed into corporate knowledge that may be extensively disseminated within a company and should be effectively used (Aliar, 2012).

A crucial component of the entire business administration system is the human capital management system. This system's goal is to provide techniques in a timely manner with staff members who possess the essential expertise, talents, and a high level of intelligence and creativity. In the current scenario, the pervasive use of software and computer technology, liberalization, and globalization of the economy have all contributed to changes in the composition and structure of human capital, as well as the way in which human capital affects the growth of the economy (Nikolaichuk and Matukova, 2016). This has drawn the attention of many researchers in the area of human capital management. The current investigation

intends to analyze the human capital-related literature with the help of the bibliometric method. It is vital to acquire the answers to a few significant questions in order to accomplish this goal.

- R1: What is the annual trend in the publications related to human capital management between the years 2005 and 2022?

Assessing the volume of documents published each year on human capital management will help in trend analysis and trend forecasting.

- R2: What is the human capital management base's intellectual framework ?

It will help to determine the connections between the scientific components of different papers, including authors, co-authors, citations, documents, and organizations.

- R3: What are the core concepts being discussed in regard to human capital management?

It is useful to identify the knowledge gaps and outline the areas that require more investigation.

## **2. REVIEW OF LITERATURE**

### **2.1 Human Capital Management**

As the world changes, so do people's expectations and levels of satisfaction in the workplace. Hence, the most valuable and fundamental capital of any organization is human capital. Any person who designs and produces output to accomplish the aims and objectives set by an organization is said to be a human resource (Lumban Goal et al., 2021). The term human capital refers to the resources an individual provides to a company, including his or her professional experience, age, and previous employment. The possession of these resources or items by the individual has a favourable effect on the firm's management (Chaddha, 2020). The theories relating to human capital have generally argued that companies can boost their human capital by enhancing the skills and abilities of their current workforce and recruiting workers with high technical skills and knowledge from the job market. The growth of human capital depends on two factors: first when employees possess the knowledge about what a company wants for its growth, and second, when the company utilizes the knowledge of its existing workforce. Variations in the performance of an organization can be attributed to differences in the organization's resources and capabilities (Choudhary and Mishra, 2020).

Hence human capital management is a core concept for the development of the company. Many organizations in the public sector frequently face difficulties in promoting employees who are generally interested in becoming leaders in such institutions. A smooth transfer of leadership is further complicated by the fact that the future generation of the government sector has distinct motivations and professional traits. Hence, by making use of some of the most appropriate guidelines encountered by both the government and the private sector, retired public servants can be replaced by existing employees who are qualified for leadership positions and management (Yvorne, 2021). From an individual standpoint, human capital refers to an individual's attitude, skill, creativity, talent, and so on. The organizational approach, on the other hand, emphasizes the sum of all human knowledge, skill, and competence. It is the sum of a company's employees' abilities, talents, and technical knowledge (CIPD, 2019).

A human capital management plan identifies the human assets and competencies required for any company to achieve its target. Human capital management includes planning for salary and benefits, long-term career planning, succession, flexibility, education and training, and

updates and upgrades to HR technology. It helps employees and organizations be resilient, which benefits the company during turbulent commercial and economic times (Mitaskis, 2019). The ability of a company to build persistence is accomplished through human capital management tactics that promote individual skill and, alternatively, help organizations to absorb risk, develop solutions, and engage in changes to take advantage of disruption (Douglas, 2021).

## **2.2 Human capital bibliometric analysis**

To evaluate the present trend in the topic of human capital management, bibliometric analysis is utilized. Menoza et al. (2019) have conducted a bibliometric analysis of human resource training. The articles published on the Web of Science between 1975 and 2016 were used for the study. Accordingly, around 900 articles were retrieved, and analysis was carried out with the help of VOS Viewer. Results show that there has been a sharp increase in research papers related to this topic since 2007. There is a positive relationship between human capital and human resource training. Rana and Pragati (2019), have made a theoretical and intellectual map showing the growth of human capital and its sustainability with VOS Viewer. Around 573 documents about this topic were extracted from journals that are on Scopus's list between January 1993 and March 2021. Detailed analysis of the literature, including co-citation analysis and co-occurrence analysis, was undertaken using VOS Viewer. They found an increase in research trends and suggested prospective directions for future use in addressing sustainability. Omar et al. (2019) have attempted to map the trend in the area of human capital management using bibliometric methods. With the help of VOS Viewer, around 1098 articles were collected from Scopus and reviewed. They found the article, "How Does Human Resource Management Influence Organizational Commitment Outcomes? A meta-analytic investigation of mediating mechanisms," written by Jiang K. (2012), is the most cited article. Qamar and Samad (2021) did a bibliometric analysis to predict future research goals in the field of human resource analytics. The goal of this study is to provide a concise summary of the current state of knowledge in the subject while also gaining a solid understanding of the theoretical underpinnings, key concepts, and most recent advancements. 125 articles that were taken from the Scopus database were evaluated using the two-tier methodology. Bibliometric analysis, network analysis, and content analysis approaches are all used in this study to give a comprehensive review of the literature that is currently accessible. The paper suggests future research topics and indicates knowledge gaps based on the content analysis of research clusters.

## **3. OBJECTIVES OF THE STUDY**

The purpose of this study was to conduct a bibliometric analysis of all the literature related to human capital management that was published between 2005 and 2022 and is available in the Dimension database, along with the following research objectives:

- To gain an understanding of the current status and growth of academic research on "human capital management."
- To determine the key domains that have been related to the area of human capital management.
- To demonstrate the relationship between the fundamental components of human capital management documents visually.

- To identify and suggest the unexplained factors related to human capital management and provide directions for further studies

#### 4. METHODOLOGY

##### 4.1 Database and search techniques

The present investigation uses bibliometric methods such as co-occurrence network and factorial analysis as well as trends in the publication to analyze the works on human capital management. Pritchard coined the term bibliometrics for the first time in 1969. The use of statistical and mathematical techniques to analyze the data from books and other forms of communication is known as bibliometrics (Pritchard, 1969). Bibliographic methods are considered an innovative tool for categorizing and quantitatively evaluating literary content, including the details of authors, citations, publications, and more of a research paper, with the help of computerized technology. Hence it is called the systematic assessment approach (Lazarides, 2023). Any bibliometric inquiry must begin by employing the best database to retrieve the most relevant documents. To achieve this aim, dimensions were used in the current investigation. Created by digital science in association with 100 notable international research institutions, Dimension gives researchers access to one of the largest centralized data libraries in the world, which contains official reports, grants, and academic writings. These entities are also connected to one another in a rich multipartite version of a citation chain (Bode et al., 2018). It allows users to delve into and access the relationships between publications and get a thorough picture of the research landscape, which includes individual researchers, educational institutions, publishers, titles, sources, and more. As a result, it is feasible and designed to meet academic needs. With deep indexing of more than 1.3 billion patents and 90 million documents, Dimension provides enriched materials that streamline research. As a basic search option, full transcript and title/abstract searching are both available in Dimension. The distinctive abstract search allows to copy and paste the whole content of an article's abstract into the search window, and Boolean operators work effectively (Badke, 2018). Additionally, it provides an option to filter the dataset based on a variety of criteria, including year of publication, list of journals, authors, type of publication, and much more.

The second step in every bibliometric analysis is developing the most pertinent search phase that will produce the highest number of publications with the fewest inappropriate findings. Countless phases might be used in the human resource management of a firm. However, in the current study, publications that were published between 2005 and 2022 were retrieved using a search query that included the keyword "human capital management" in the title and abstract. The search was conducted on February 23, 2023. A total of 910 documents were produced. Then it was restricted to the documents published between 2005 and 2022. Out of these 910 documents, 870 satisfy the criteria. And further, it was limited to the research categories, including articles, edited books, proceedings, and chapters. Accordingly, 813 publications across the above-mentioned categories were extracted from the dimension for analysis. Out of these 813 documents, 610 were articles, 126 were chapters, 64 were proceedings, and 13 were edited books.

#### 4.2 Bibliographic matrices

The literature that was extracted from Dimension was transferred to Microsoft Excel. The data that was exported included information on the publication trend annually, the type of documents, details regarding authors, co-authors, citations, organizations, and much more. The data was further exported and downloaded in a.csv file format to create network visualization maps using VOS Viewer. Due to its effective interface for analyzing and reviewing bibliometric charts, VOS Viewer facilitates the presentation of datasets for easier interpretation (Cobo et al., 2011; Komiyama and Yamada, 2018). VOS Viewer version 1.6.18 was used to evaluate the co-occurrence, citation, bibliographic coupling, co-citation, and other themes. "Total link strength" and "link strength", two common weight attributes, are used (Stephen et al., 2017). TLS illustrates the strength of international collaboration in research by visualizing the research activities of various nations, authors, and much more. The level of collaboration is higher if TLS is greater. The research procedure is shown in below Figure 4.2

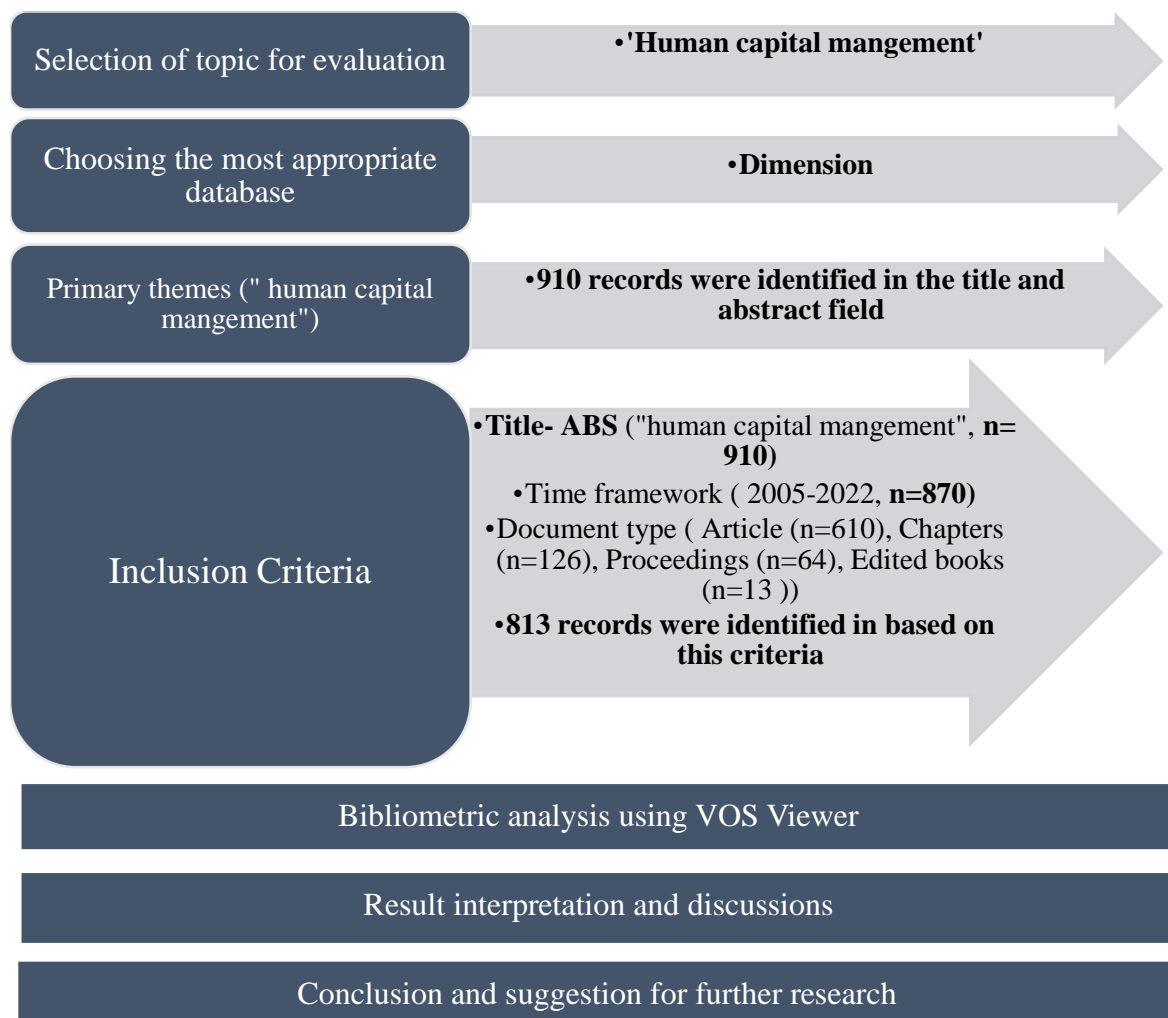


Figure 4.2: Research procedure

#### 5. RESULTS AND DISCUSSION

The findings of this article are divided into three parts. Firstly, the paper makes a productivity analysis based on the trend in annual production and the author's productivity based on the

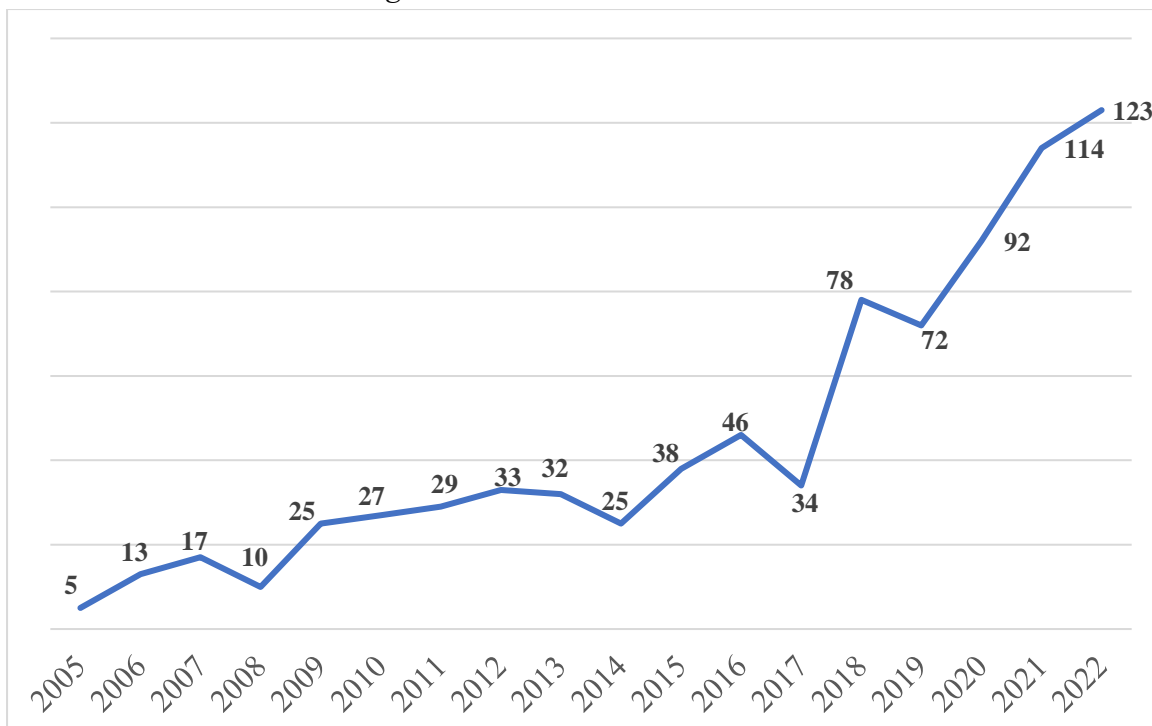
number of articles published by the same author between the years 1992 and 2022. Secondly, a performance analysis is undertaken to know the high-quality journal. Thirdly, it explores the co-occurrence network among the titles and abstracts of documents. Finally, in human capital management, the paper looked at the co-citation of references, authors, and journals.

### 5.1 Productivity analysis

#### 5.1.1 Annual Production Trend

In the present study, human capital management was analyzed using the bibliometric method. The figure displays the trend in annual publications in the field of human capital management. Except in the years between 2013-14, 2016-17, and 2018-19, the production analysis demonstrates an upward trend, that reflects the growing interest in the study of human capital management. This may be due to increasing awareness of companies on how to use their human capital effectively and secure market leadership. Between the years 2005 to 2015, the publication was increasing slowly (in some years, it declined). In the year 2022, a maximum number of papers related to human capital management were published and between 2017-18, the percentage increase in the production of research papers reached its maximum (around 130% growth). The results were in line with a comparable study by Omar et al.,2021 which found an increasing trend in the production of human capital management annually. By analyzing 1098 papers retrieved from the Scopus database between the years 2008 to 2018, Omar et al., concluded that although between 2008-12, the publication was stagnant, after that it began to increase from 2012 slowly, and resumed to soar dramatically in 2015. To improve performance, businesses need to know how to manage their human resource effectively (Omar et al.,2021). This is shown in the figure 5.1.1

Figure 5.1.1: Annual Production Trend



Source: Authors' own evaluation

#### 5.1.2 Author's Productivity Analysis

Productivity analysis often helps to find out the researchers who are working in this area between the years 2005 to 2022. Accordingly, Cahyaningsih, E., (12 articles) and Sensuse, D.I., (12 articles) ranked top in publishing articles between the year 2005-2022 followed by Wibowo, W.C., (8 articles). The top ten authors who have published at least 5 papers in this field are listed in the below table 5.1.2

Table 5.1.2: Author's Productivity Analysis

| Author          | Number of papers |
|-----------------|------------------|
| Cahyaningsih. E | 12               |
| Sensuse. D. I   | 12               |
| Wibowo. W. C    | 8                |
| Dziwulski. J    | 6                |
| Harasim. W      | 6                |
| Kucharcikowa    | 6                |
| Miciak. M       | 6                |
| Brook. R. A     | 5                |
| Douglas. S      | 5                |
| Kleinman. N. L  | 5                |

*Source: Authors' own evaluation*

### 5.2 Performance analysis

Performance analysis attempts to measure the influence of author, and documents in any research area given by tracking the number of times a work is cited. Though a large number of research papers have contributed to the area of human capital management, the quality of a research paper is directly correlated with its citation count, which reflects the authors' academic performance. In the current research, Kim, S has the greatest number of citations. His paper mainly focuses on the discussion of electronic governance, global security, and human capital management of which all revolve around the sharing of knowledge and data. A study has been undertaken in the five South Korean organizations from both government and private sector. Accordingly, it was found that worker knowledge-sharing capacities were discovered to be significantly impacted by social networks, centralization, use of IT tools by staff, and compensation schemes in the firms. The second most cited paper is by Aral et al.,2012. The paper discussed the interrelationships between information technology, human capital management, and employee compensation. The study identified that the use of HCM software is most prevalent in businesses that also use performance pay and HR analytics techniques, and that using HCM as an organizational incentive structure is associated with a significant productivity boost.

The top documents with the highest number of citations are given below in Table 5.2.



*Table 5.2: Performance analysis*

| Author,<br>Year of<br>publication | Title  | Total<br>Citations |
|-----------------------------------|--|--------------------|
| KIM S,<br>2006                    | The Impact of Organizational Context and Information Technology on Employee Knowledge-Sharing Capabilities                         | 384                |
| ARAL S,<br>2012                   | Three-Way Complementarities: Performance Pay, Human Resource Analytics, and Information Technology                                 | 190                |
| BODE C,<br>2015                   | Corporate Social Initiatives and Employee Retention  | 121                |
| CHEN H,<br>2010                   | Linking employees' e-learning system use to their overall job outcomes: An empirical study based on the IS success model           | 110                |
| GROSSER<br>K, 2005                | Gender Mainstreaming and Corporate Social Responsibility: Reporting Workplace Issues   | 106                |
| KUMAR A,<br>2016                  | Model Selection Management Systems   | 74                 |
| WEISKOPF<br>R, 2011               | Management of human capital: discipline, security and controlled circulation in HRM  | 68                 |
| FELIN T,<br>2009                  | The knowledge economy: emerging organizational forms, missing micro-foundations, and key considerations for managing human capital | 61                 |
| RILEY SM,<br>2017                 | Human capital matters: Market valuation of firm investments in training and the role of complementary assets                       | 61                 |
| BONTIS N,<br>2007                 | The moderating role of human capital management practices on employee capabilities   | 57                 |

*Source: Authors' own evaluation using VOS Viewer*

*Source: Authors' own evaluation using VOS Viewer*

### **5.3 Co-occurrence Analysis**

Co-occurrence network visualization shows the overall connections between the significant texts based on their associated existence. In this study, the terms identified in the title and abstract of various papers were used to build a co-occurrence network map. The weight is computed using the total link. Interconnection between these phases was determined with the aid of VOS Viewer software, and clusters were created as a result. For constructing this, the minimum number of term occurrences was limited to 10. And out of 14266 terms, 447 meet the threshold. Accordingly, 6 clusters were formed as shown in Figure 5.3a. Words such as capital (cluster 3, 12960 total link strength), employee (cluster 6, 8577 total link strength), relationship (cluster 1, 3588 total link strength), technology (cluster 4, 4613 total link strength), value (cluster 5, 3455 total link strength), capability (cluster 2, 1542 total link strength) are the



|                     |     |
|---------------------|-----|
| Condition<br>0.519  | 131 |
| Challenge<br>0.4627 | 105 |

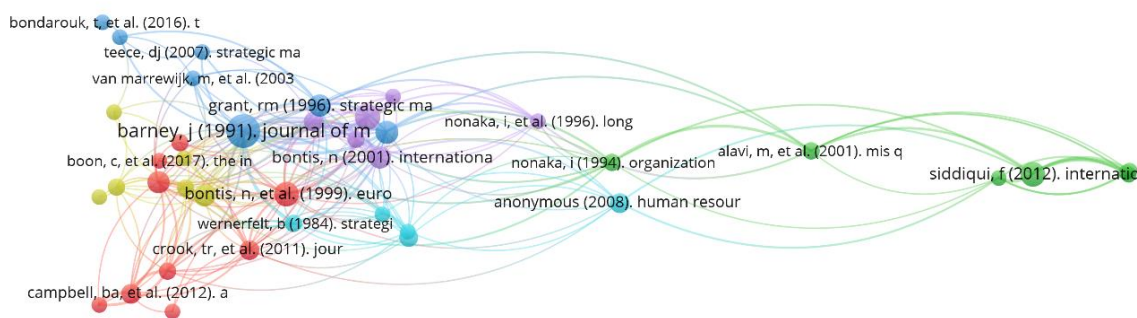
Source: Authors' own evaluation

### 5.4 Co-citation Analysis

#### 5.4.1 Co-citation of references

This investigation begins with the co-citation of reference. The reports' node demonstrates how multiple papers and various scientific fields in human capital management are related to one another. Figure result reveals that out of 813 research papers on human capital management, Barney, J (1991) has received the highest citation (23) with a total link strength of 63. It was followed by Bantis, N (1998) with a citation of 166 and Siddiqui, F (2012) with 14 citations. The following Figure 5.4.1 depicts the co-citation of references.

Figure 5.4.1: Co-citation of references



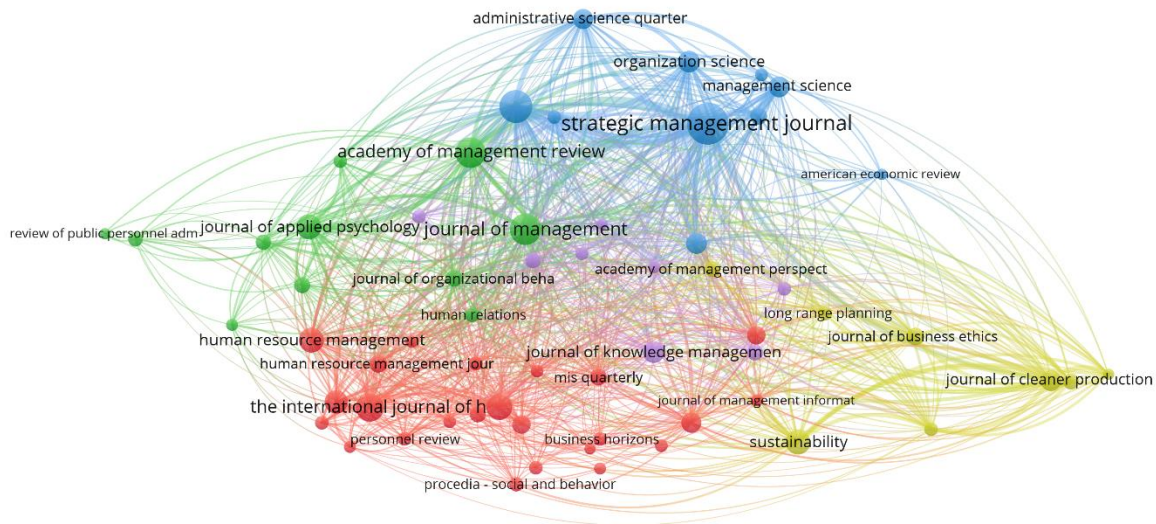
Source: Authors' own evaluation using VOS Viewer

#### 5.4.2 Co-citation of sources

After analyzing the citation of references, the paper concentrates on the interconnections between co-citations among various authors. The reports' node properly depicts the quantity and pattern of published documents. The criteria for the evaluation were specified as a minimum of 20 citations per source, and out of 2393, 61 meet the threshold. Accordingly, 5 clusters were formed as shown in figure 5.4.2: cluster 1 (red, 24 items), cluster 2 (green, 11 items), cluster 3 (blue, 10 items), cluster 4 (yellow, 8 items) and cluster 5 (violet, 8 items). The following are the top journals with the highest citations: Strategic Management Journal (244 citations, 7779 total link strength), Academy of Management (156 citations, 4852

total link strength), Journal of Management (140 citations, 4037 total link strength) are the most widely used journals in this area.

Figure 5.4.2: Co-citation of sources

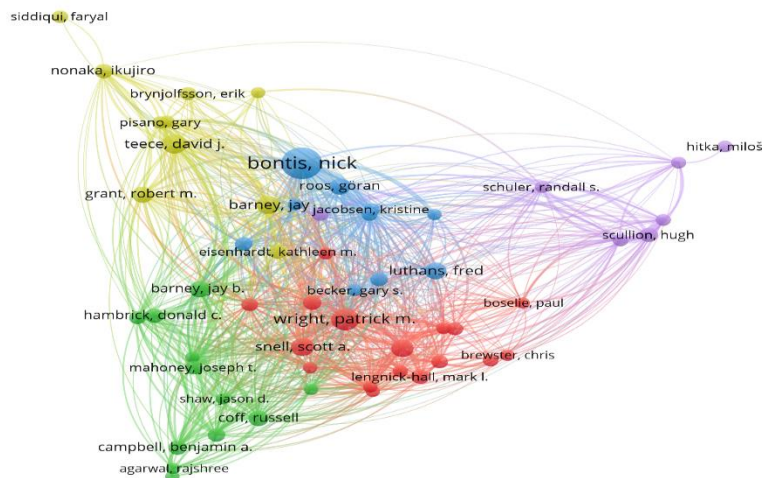


Source: Authors' own evaluation using VOS Viewer

### 5.4.3 Co-citation of Authors

Co-citation analysis among the authors is carried out to examine the relationship between those authors whose works are referenced in the same publication. An author with a minimum of 10 citations is considered in the present study. This is illustrated in Figure 5.4.3. Accordingly, among 14966 authors, only 56 meet the criteria. The top three authors co-cited are Nick Bontis ( 75 citations, 495 total link strength), Patrick Wright M (36 citations, 466 total link strength), and Dvid Teece J ( 27 citations, 253 total link strength).

Figure 5.4.3: Co-citation of authors



## 6. CONCLUSION

The current research helps provide a better overview of the state of research related to human capital management. The research is carried out over 17 years (2005-2022), covering the whole publication in this area in the dimension database and thereby enabling the creation of a thorough overview. It was from the year 2015, that research papers related to human capital management increased. The maximum volume of research papers has been published in the year 2022 (123). There was a growth of 130% in the research publication between the years 2017-2018. Cahyaningish.E., has published the highest number of documents in the area of human capital management. The article titled 'The Impact of Organizational Context and Information Technology on Employee Knowledge-Sharing Capabilities' by Kim, S., has received the highest number of citations (384 citations). Co-citation analyses were undertaken to study the intellectual structure of human capital management research. Barney, J. topped in the co-citation analysis of references with a citation of 23 and a total link strength of 63. Among the co-citation of sources, Strategic Management Journal has the highest citation (244 citations, 7779 total link strength). Nick Bontis ranked first among the co-citations of authors. The research relating human capital management to capital, employee, and enterprise, relationships has drawn the attention of researchers. The conclusion indicated that the field of human capital management will mature in the future. And more importance should be placed on the topic relating human capital management to entrepreneurship, organizational management, and artificial intelligence.

## 7. LIMITATIONS AND FUTURE RESEARCH

Notwithstanding the advantages of the paper, certain issues need to be resolved. Firstly, data for the current study was taken from a single database- Dimension- rather than multiple databases. Even though Dimension offers a sizable number of research papers, we might take into account another database such as Scopus, or Web of Science, so that wider coverage of literature will be assessed. Secondly, the current study uses the keyword 'HUMAN CAPITAL MANAGEMENT' only for retrieving data it can be further extended to 'HUMAN CAPITAL MANAGEMENT' AND 'EMPLOYEES' EFFICIENCY', 'HUMAN CAPITAL MANAGEMENT' AND 'WORKERS' PRODUCTIVITY'. VOS Viewer was employed for the analysis of the current study. Bibexcel, Gephi, and R may be used in the future study. The findings of the current study may aid academicians in identifying areas that require additional study in the future. For all researchers who are interested in human capital management, this bibliometric analysis can serve as a starting point.

**Conflict of Interest:** There is no conflict of interest and funding for this research

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