Visualizing the Human Capital Management Research Domain: A Bibliometric Analysis Approach

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Abstract

The research on human capital management has extensively emerged in recent years. Organizations need to know how to manage human capital effectively to boost performance. Many literature reviews have been published on the specific aspects of human capital management. However, less attention has been given to bibliometric and network analysis aspects. Hence, the purpose of this study is to visualize the research domain of human capital management by conducting a bibliometric analysis. The analysis was performed using Scopus Analyzer available in the Scopus database and VOSviewer software. A total of 1098 publications concerning human capital management were extracted from the Scopus database ranging from 2008 to 2018. Co-citation and co-word analysis were conducted to graphically illustrate the publication trend and to identify areas of current research interests. The outcome of this study may assist researchers in understanding the nature of human capital management research domain from across the world and suggest future research directions.

Keywords: Human Capital Management, Bibliometric Analysis, Co-citation Analysis, Co-word Analysis

1. Introduction

Human capital is considered as the driver for creativity in organizations, which requires an awareness of high levels of skills, experiences, and basic capabilities as requirements for the future security of individuals and organizations (Mahafzah et al., 2020). Human capital is a critical construct in a variety of disciplinary fields; thus, it is not surprising that different streams of research focus on slightly different aspects and levels of human capital within organizations (Boon, Eckardt, Lepak & Boselie, 2018). Zin, Mat, Manaf, Muhammad, Mansor, and Hashim (2018) asserted that the Important-Performance Matrix Analysis (IPMA) of enterprises shows human capital is one the most important variables that should be managed strategically to increase a firm's business performance. This may be because human capital management (HCM) practices have an outstanding and crucial role in employees' performance (Zeb, Abdullah, & Javaid, 2018), which will then bring to higher levels of organizational performance. The utilization of organizational resources, including human capital, is clarified in the Resource-

based View theory (RBV) which leads to sustainable competitive advantage for the organization (Dangelico, 2015). In keeping with the RBV approach, HCM explains the vitality of firm reputation and stresses the usefulness of organizations' valuable intangible assets to boost performance. Undeniably, organizations depend on their human capital to evolve, however, their HCM is deficient which makes their sustainability vulnerable (Núñez-Ríos, Sánchez-García & Tejeida-Padilla, 2020).

HCM refers to how human capital is managed to create and capture economic value. In HCM, organizations are endeavoring in their capabilities to better hunt for talent (Black, Hasan & Koning, 2020). However, the way talented human capital is managed is not widely known (Thunnissen, 2016). The need to manage knowledge and deliver high-quality human capital becomes a particularly important issue due to the need to support the advancements in information technology. Various factors that can increase the human capital of the employees and their use in the task should also be given an emphasis (Ployhart & Moliterno, 2011). This includes their attitude and skills which affect effectiveness in public relations practices (Ramli & Samat, 2020). However, having such commendable staff is not the complete criteria in sustaining business profitability. It includes strategic HCM that can lead the organization to greater heights. Specifically, managers should practice HCM by retaining talented employees with high levels of human capital because these workers exhibit the required behaviors and work together effectively to positively influence organizational performance (Harris, Wright & McMahan, 2019). HCM practices create talented creative and knowledge-based employees who are very likely to generate new ideas and improve the innovation performance of organizations (Hossain & Roy, 2016). In an open world economy, wealth creation is determined by technological innovation (Teece et al., 2000). Hence, it is important to manage human capital in the context of innovative activities, focusing on the creation as well as the implementation of innovations (Borowiecki, Kusio & Siuta-Tokarska, 2019).

Still, recent literature remains fragmented with studies differing the conceptualization of HCM and the study contexts. Realizing the circumstances, this study aims to analyze HCM issues published in leading HCM journals, identify different human resource management research streams in the HCM literature, and propose areas for future research. In this study, the researchers will address the concept of HCM via the bibliometric analysis, and, the presentation of maps of the relationship between keywords, clusters of research areas, as well as the maps of density of article citations. To posit HCM research trends, the first section of this paper begins with an overview of HCM. Then, the study attempts to explain the bibliometric analysis, materials, and methods. The last section presents the result and discussion, followed by a conclusion, discussion, and future research directions.

2. Bibliometric Analysis

Hawkins (2001) defined bibliometrics as "the quantitative analysis of the bibliometric features of a body of literature". In other words, bibliometric analysis is a method that includes statistical analysis of published articles and citations to measure their impact. For this study, a bibliometric approach was employed to map literary production within a given area of study and to determine the structure and trends of a field of study. By using quantitative methods in analyzing journals, books, proceedings and other publications, the researchers can identify

patterns in human capital management literature. Furthermore, bibliometric analysis assists researchers to identify the most prolific authors, institutions, countries, journals within a field, the types of work, and the number of citations and collaboration between authors (Blažun, Kokol & Vošner, 2015).

Two aspects of bibliometric mapping can be distinguished which are the construction of bibliometric maps and the graphical representation of such maps. In the bibliometric literature, most attention is paid to the construction of bibliometric maps. VOSviewer software package was adopted as a mapping technique due to its powerful user-graphic interface that can generate maps to describe the connections of each unit of analysis (Feng, Zhu & Lai, 2017). Data on co-occurrences of words can be used to construct so-called co-word maps, which are maps that provide a visual representation of the structure of a scientific field (Van Eck & Waltman, 2009). The number of co-occurrences of two keywords is the number of publications in which both keywords occur together in the title, abstract, or keyword list (Van Eck & Waltman, 2014). In this technique, the article is considered the unit of analysis and it is deliberated to illustrate interconnections among the articles and research domain by looking at how many times an article is cited and co-cited by other articles (Van Eck & Waltman, 2018). Apart from co-word maps, bibliometric can also generate co-citation analysis which relies on the assumption that published articles in scholarly journals build their research on similar articles that were published before (Van Raan, 2012). In co-citation analysis, the relatedness of researchers is determined based on the degree to which they are cited in the same publications. The more often two researchers are cited in the same publications, the stronger is their relatedness (Perianes-Rodriguez, Waltman & Van Eck, 2016).

3. Methodology

3.1 Database Choice and Search Strategy

Scopus database was selected since it is the largest and the most comprehensive global abstracts and citation database, covering many publications in the fields of science, technology, medicine, social sciences, and arts and humanities. The database was employed using the string term “Human Capital Management” in the titles, abstracts and keyword fields or TITLE-ABS-KEY (human AND capital AND management). The publication years were limited from 2008 to 2018. Based on the search strategy implemented, a total of 12534 peer-reviewed articles were retrieved from the Scopus database. Then, the titles and the abstracts of all articles were reviewed for relevance to human capital management. The search was limited to only article publication type, journal as source type, a subject area in business, management, accounting and social sciences, and all articles need to be in the English language. As a result, 1098 articles were retained for further analysis. Elements of data were extracted from each information source such as the abstract, author’s affiliation and the name of institution, the year of publication, the names of sources, and the number of citations.

3.2 Data Analysis

Data were analyzed using Scopus Analyzer and VOSviewer. Scopus Analyzer was used to check on the descriptive analysis. Then, the data were exported to Excel spread sheet for data

cleaning. From 2008 to 2018, Excel spread sheet and Scopus Analyzer were employed to identify publication trends, the most productive journals, contributing authors, contributing institutions, contributing countries and the most cited article. Additionally, the SCImago Journal and Country rank website was referred to check on journal rankings and H-index. The retrieved CSV text files were exported to VOSviewer to construct and map the bibliometric network. VOSviewer was also applied for co-citation analysis and co-word analysis to explore research patterns and clusters in the field of study (Van Eck & Waltman, 2014).

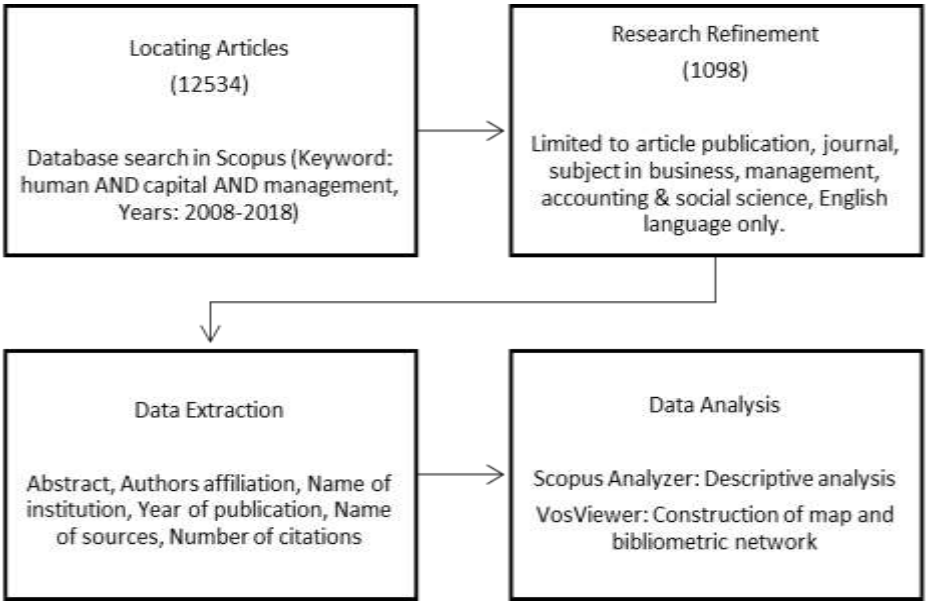

Fig. 1 Article Selection and Data Analysis Process

4. Results

4.1 Descriptive Analysis

Figure 2 shows the publication trend in the area of human capital management per year. It shows an ascending trend that manifests the increasing interest in the research area of human capital management. During the first four years, the publication was stagnant. The interest in human capital management research started to grow mainly in 2012 but slightly dropped over three years and then began rising exponentially in 2016. It shows that more than 70% of the total published articles in human capital management were published between the period of 2012 and 2018. The increasing number reflects the growing interest from academia in the importance of the research domain. Furthermore, the trend also predicts that publications will continue to grow phenomenally in the coming future.

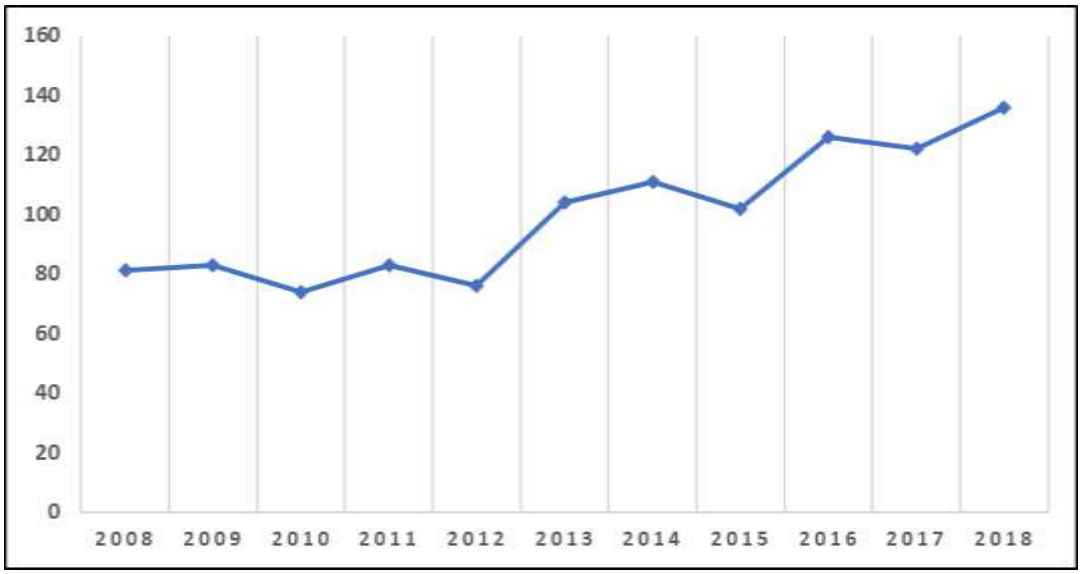

Fig. 2 Publication Trend in the Area of Human Capital Management

Based on the findings generated from Scopus Analyzer, 165 journals contributed to the publication of 1098 articles. Ten journals were identified as the most productive journals published, whereby, approximately 22% of all articles between 2008 and 2018 were in the area of human capital management. As shown in Table 1, the top 10 productive journals within 10 years were Journal of Intellectual Capital with 53 publications, followed by the International Journal of Human Resource Management with 45 publications. Both of the journals have SCImago Journal Rank of 1.29 and 0.96, respectively. Of all the 10 productive journals, the highest H-index of 283 belongs to a journal known as the Academy of Management Journal. It is interesting to note that 6 out of 10 productive journals that published papers on human capital management were categorized under Quartile 1 (Q1), Journal of Intellectual Capital (SJR-1.29), International Journal of Human Resource Management (SJR-0.96), Strategic Management Journal (SJR-8.84), Journal of Knowledge Management (SJR-1.28), Academy of Management Journal (SJR-10.76) and Journal of Management Studies (SJR-3.14). A total of 175 articles were published between 2008 and 2018 from these Q1 journals.

Table 1: The Top 10 Productive Journals Contributing to the Area of Human Capital Management during 2008-2018

Journal	**2008-2018**	**SJR**	**H**
Journal of Intellectual Capital	53	1.29	73
International Journal of Human Resource Management	45	0.96	98
Strategic Management Journal	32	8.84	253
International Journal of Learning and Intellectual Capital	21	0.33	14
Journal of Knowledge Management	18	1.28	95
Quality Access to Success	17	0.23	19
International Journal of Manpower	15	0.37	49
Academy of Management Journal	14	10.76	283
International Journal of Knowledge Culture and Change Management	13	0.11	7
Journal of Management Studies	13	3.14	158

Note: SJR – SCImago Journal Ranking, H - h-Index

Table 2: The Top 10 Contributing Institutions in the Publications of Human Capital Management

Institution	Location	No. of Publications
Texas A and M University	United States	12
National University of Singapore	Singapore	9
Cranfield School of Management	United Kingdom	9
Cranfield University	United Kingdom	8
University of Pennsylvania	United States	8
University of Washington, Seattle	United States	8
University of South Carolina	United States	8
Indiana University	United States	8
Università Bocconi	Italy	8
Kazan Federal University	Russia	8

Table 2 lists the top 10 institutions that published the most papers on human capital management, their geographic location and the number of articles contributed. Texas A and M University in the United States published the most with 12 articles, followed by the National University of Singapore in Singapore and Cranfield School of Management in the United Kingdom. Although Texas A and M University was listed as Top 1 contributing institution, the authors from this university were not listed under the top ranked authors. Similar situations existed at the National University of Singapore and Cranfield School of Management.

Based on Scopus Analyzer, the ten most highly cited articles on human capital management are displayed in Table 3. For each article, the first author, year of publication, the title of the articles and the number of total citations were provided. The most influential article has been cited 432 times by many authors in human capital management studies and this article was published in the Academy of Management Journal. In addition, the most cited article was written by Jiang, K as the main author in 2012 on the title "How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms", which received a total of 432 citations in Scopus. Results also revealed that most of the highly-cited articles in the human capital management area were published in the Academy of Management Journal and Strategic Management Journal.

Table 3: Ten Most Cited Human Capital Management Articles for the Period of 2008-2018

Year	TC	Title	Main Author
2012	432	How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms.	Jiang, K.
2011	315	Emergence of the human capital resource: A multilevel model.	Ployhart, R.
2009	301	Women directors on corporate boards: A review and research agenda.	Terjesen, S.
2009	202	Intellectual capital architectures and ambidextrous learning: A framework for human resource management	Kang, S.C
2011	173	What is social sustainability? A clarification of concepts.	Vallance, S.
2009	170	Contingencies within dynamic managerial capabilities: Interdependent effects of resource investment and deployment on firm performance	Sirmon, D.G.
2011	150	Exploring human capital: Putting 'human' back into strategic human resource management.	Wright, P.M.
2015	123	Women on boards and firm financial performance: A meta-analysis.	Post, C.
2009	110	Supply chains and the human condition	Tsing, A.
2013	98	Skill relatedness and firm diversification.	Neffke, F

Note: TC-Total Citations

4.2 Co-citation Analysis

In co-citation analysis, the unit of analysis was on authors. A co-citation analysis can measure the correlation degree between two different articles. Furthermore, it can explore the relationship among authors who could but did not collaborate actively (Feng et al., 2017). According to co-citation analysis, the relatedness of authors is determined based on the degree to which they are cited in the same publications in which the more often two authors are cited in the same publications, the stronger their relatedness would be (Perianes-Rodriguez at al., 2016). Apart from it, co-citation analysis can be applied to identify emerging research topics that could assist the researchers in expanding the research domain in the future. In this study, the co-citation network is visualized in Figure 3. Table 4 shows the ten prominent authors in human capital management research. These results were obtained from VOSviewer software.

It is suggested that the cut-off point needs to be established if the study sample had a large number of citations for each author. By doing so, only the most influential papers with the most prominent authors will be selected. Thus, this study selected the authors with a minimum number of citations which is at least 20 times. Based on the findings, out of 51996 authors, only 605 authors met the threshold and selected for co-citation network analysis. For each of the 605 authors, the total strength of the co-citation links with other authors was calculated. However, for this study, only ten authors with the greatest total link strengths were selected as shown in Table 6. Figure 3 shows that the size of the bubble presents the normalized number of citations received by articles, whereas the thickness of the lines represents the strength of co-citation ties. The link between the two articles identifies the co-citation relationship and relatedness between the two (Leung, Sun & Bai, 2017). For this study, Snell, S.A was identified as the author that has the greatest total link strength (22123) with the highest number of citations (388). Moreover, the color of the bubbles indicates the identified cluster in which the article is associated with. As shown in Figure 3, co-citation network analysis developed five clusters that were related to one concept of human capital management. The cluster marked in red was the strongest cluster with 202 items, followed by a green-colored cluster which consisted of 121 items. The third strongest cluster was indicated by a blue-colored cluster (100 items) while the cluster marked in yellow was identified as the fourth-strongest cluster with 99 items. The weakest cluster was a cluster marked in purple which only had 83 items. For that reason, the occurrences of the authors who were cited actively in human capital management research can be seen in the above-mentioned clusters.

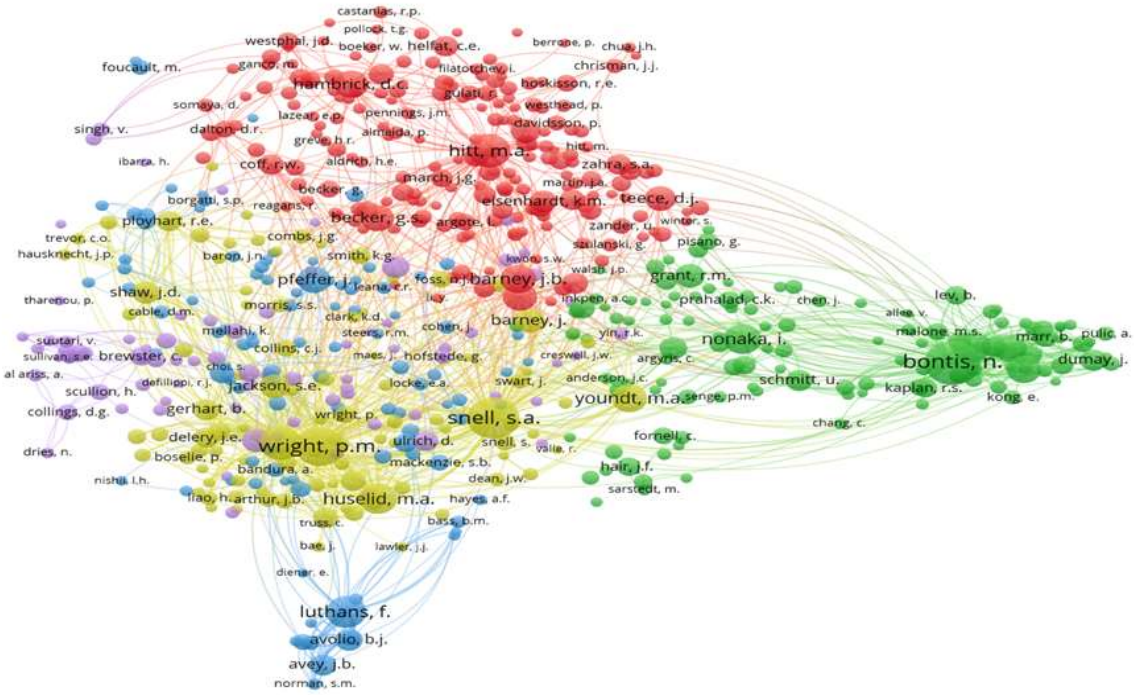

Fig. 3 Mapping of Co-citation Network On Human Capital Management Research

Table 4: The Ten Prominent Authors with Highest Total Link Strength

Authors	TLS	Citations
Snell, S.A	22123	388
Wright, P.M	20288	346
Lepak, D.P	17075	263
Bontis, N	16696	448
Hitt, M.A	14212	260
Huselid, M.A	12308	226
Youndt, M.A	10829	188
Barney, J.B	9643	186
Edvinsson, I	9024	222
Roos, G	8853	164

Note: TLS – Total Link Strength

4.3 Co-word Analysis

Co-word network is applied to show the relationships among the keywords in each field (Leung et al., 2017). The mapping process was prepared by importing a text file derived from the Scopus database to VOSviewer. From 2008 to 2018, 1098 articles were identified and the keywords were extracted for the process of generating maps (refer to Figure 4). As a result of the extraction process, 218 keywords met the threshold where the minimum number of occurrences was at least

5 times. By adopting VOSviewer, it is possible to develop a map of links between keywords and a map of clusters of the specific research area. VOSviewer has a powerful user graphic-interface which allows the researchers to generate maps conveniently (Feng et al., 2017). Furthermore, this network visualization tool can assist the researchers by providing more information about the incidence of co-occurrence of keywords in any research area.

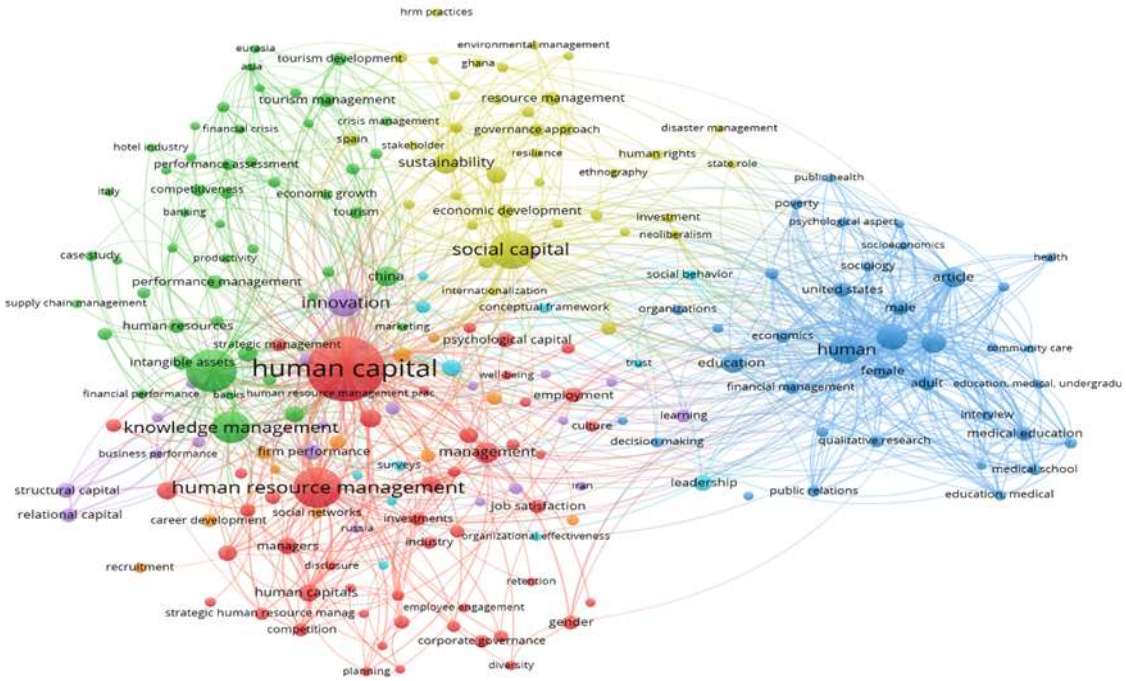

Fig. 4 Mapping of Co-Word Network on Human Capital Management Research

Figure 4 illustrates the co-word network concerning human capital management research. The map shows the links between the keywords which occurred in this particular research area. It is interesting to note that the thickness of the line indicates the strength of the co-occurrence of keywords. Those elements located on the edges of the map are characterized by a small number of links between them, whereas the central location means strong relationships connected with more numerous groups of other keywords (Lulewicz-Sas, 2017). Located at the central part of the map, the finding showed that the strongest keyword was human capital which linked to more diverse groups of other keywords or popularly occurred in some human capital management research.

Furthermore, the analytical tool generated seven research clusters within the concept of human capital management. The keywords were categorized into different clusters based on their frequent co-occurrence in specific articles indexed by Scopus. The findings found that the strongest cluster was marked in red with 49 keywords. This cluster was identified to be the strongest since it was linked to the largest group of keywords. The most popular keyword within this cluster was human capital with 276 occurrences. The second generated research cluster was marked in green with 49 keywords. The most common keyword within this cluster was

intellectual capital which occurred 119 times. The third research cluster generated from the analysis was marked in blue with 37 keywords. Keyword that was primarily used in this cluster was human with 53 occurrences. The fourth of the identified research cluster was visualized in yellow. The most well-liked keyword included in this cluster was primarily social capital with 90 occurrences. The fifth cluster was marked in purple and the most popular keyword in this cluster was innovation with 52 occurrences. Cluster 6 and Cluster 7 had relatively fewer keywords, which indicated that the current research on human capital management in these clusters was still at the initial stage. The most common keywords in Cluster 6 and Cluster 7 were knowledge (19) and training (13), respectively. Based on the clusters above, the most frequently cited keywords in human capital management research were human capital, human resource management, intellectual capital and social capital. The categorization of keywords is illustrated in Table 5.

Table 5: Co-word Cluster of Human Capital Management Research

Cluster	No of Keyword	Keyword (Highest Weight Occurrences)
1	49	Human Capital (276), Human Resource Management (108)
2	49	Intellectual Capital (119)
3	37	Social Capital (90)
4	37	Human (53)
5	23	Innovation (52)
6	12	Knowledge (19)
7	11	Training (13)

5. Discussion and Conclusions

This study applied bibliometric analysis to visualize scientific research on HCM. A total of 1098 articles related to HCM was analyzed using VOSviewer software. These articles were extracted from the Scopus database from the year 2008 to 2018. The key journals, influential institutions, impactful and trending articles were identified. It can be concluded that the Journal of Intellectual Capital, International Journal of Human Resources Management and Strategic Management Journal are the leading journals, while the most influential institutions are Texas A and M University of the United States, the National University of Singapore and Cranfield School of Management. The most prominent authors with the highest citations were identified as Jiang and Ployhart with 432 and 315 citations, respectively. Finally, the HCM or discussion by researchers can be divided into seven clusters, and among the most frequently cited keywords in HCM research are human capital, human resource management, intellectual capital and social capital. The HCM works are mainly focused on human capital, whereas the discussion on training keyword is the least focused after knowledge. This means that the researchers are more attentive to human resource that generates and retains organizational value rather than an approach to people management that could be treated as a high-level strategic issue. Finally, future research studies might consider conducting a bibliometric analysis on human capital management using other different bibliographic databases such as Web of Science or other content databases namely ProQuest, Emerald, and EBSCOhost, which would contribute to gathering more information and reaching a better understanding of the topic.

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