



# Role of Artificial Intelligence in the Transformation of HRM: A Bibliometric Analysis

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**Abstract.** Technology has had an intense effect on the transformation of human resource management functions. It is not only in the HR department but also in finance, marketing, and production departments that technology has been immersed in. Artificial intelligence helps the organization work faster and more efficiently to compete at the global level. AI redefines and re-shapes HR practices like recruitment, selection, appraisal, work redesign, compensation, etc., which facilitates HR transformation. If companies perfectly blend HR functions and technology by re-transforming, their workplace understanding of AI applications will be a stepping-stone towards HR transformation. In the present study, an attempt is made to investigate the publications in the field of AI in HR transformation concerned with bibliometric analysis. The Scopus database is considered a literature database 192 documents from 2010 to 2024. The collected data analyses the collaborations between authors, universities, and countries in the field to identify the most influential authors, universities, countries, type of publication, subject area, the top country in publication, and keyword network. The result is insight into valuable information, and it is found from the analysis that the interest of researchers in the topic was at a peak in year 2023. The top research areas associated with AI and HR transformation include Computer Sciences, Social Sciences and Economics, Econometrics and Finance, Engineering, Business Management and Accounting contributed the most related publications. These findings can guide future researchers to set up a baseline before instigating the importance of AI in HR transformation.

**Keywords:** HRM, Artificial Intelligence, Natural Resource Management, Resource Allocation, HR Transformation.

## 1 INTRODUCTION

Contemporary Artificial Intelligence has revolutionized every aspect of HRM (Rao and Verweij, 2017; Alghnimi et al., 2020) because of up-gradation in technology. According to the research (Aayog, 2018), there has been a 50% annual increase in global financing in the field of AI (Pillai and Sivathanu, 2020). In relation to HRM, AI helps in making decisions more efficaciously and efficiently to improve the HR Practices, and improve the talent procurement and engaged workforce (Muduli and Trivedi, 2020; Wheeler and Buckley, 2021). The enforcement advanced technologies transforms business operation conducted on a domestic or international scale and has an enormous effect on how work is structured, employees are reinforced, and workplace procedures shifted (Abraham et al., 2019; Agrawal et al., 2017; Duggan et al., 2020; Malik et al., 2020a; 2022; McColl & Michelotti, 2019).

The combination of industry 4.0 and highly skilled talent will be the foundation for sustainable competitive edge (Mefi and Asoba, 2021). AI-supported HRM denotes the HRM function's ability to use AI approaches in business intelligence systems to gather, procedure, and evaluate data to support making choices and solving issues for favorable HRM-specific operational, relational, and effects on transformation (Prikshat et al., 2023)

## 2 LITERATURE REVIEW

HRM describes "the acquiring and keeping of novel talents, abilities, and competencies in an organization through its workforce through the use of different leadership approaches" (Tambe et al., 2019). A recent Forbes article mentioned that HR is projected to become both digital and human in the future (Forbes, 2019), claiming that modern technology will play a critical role in HRM functions.

Artificial intelligence (AI) is defined as the use of "machine learning, analytical analysis, and logic-based techniques to decode events, facilitate and execute decisions, as well as perform actions." AI is an umbrella term that includes technologies that enable a computer to execute operations, such as flexible decision-making, that usually involve human cognition (Tambe et al., 2019). Organizations can optimize key business results with AI and associated intelligence-based applications, including improved productivity, cost-effective service excellence (CESE), and outstanding service (Wirtz, 2019).

AI brings radical changes in HRM practices. Application of AI in hiring process increases the proficiency and precision (IBM, 2018a; Peck, 2013). Job applicants desire unbiased transparent treatments, equal chances (Speicher et al., 2018), and

impartiality (Lee, 2018; Jasanof, 2016; Shilton et al., 2013). The accessibility of the internet has created numerous possibilities for both companies and job applicants (Zeebaree et al., 2019). Advertisement of vacant job positions is done through various means of mode like through website, linkedin, social media and many more. It helps job seekers to apply for the vacant position through online mode which helps them to hire best and suitable candidates within less time and cost effectively. The application of AI to HR functions like hiring, training, talent management, and retention was highlighted by (Ruby and Merlin's, 2018).

In the context of the workforce, application of AI plays an important role in how work is to be done and its productivity. AI simplifies work by handling routine tasks, freeing up humans to concentrate on creative, analytical, and strategic activities (Vincent, 2021). Artificial Intelligence (AI) plays a critical role in the human resource department's operations. It can manage hiring, performance reviews, training and development, job allocation, workload reduction, and overall workplace efficiency (Priya, 2021).

AI-driven performance management can assist in removing these unpleasant surprises for both employees and the organization. Allowing real-time touch points, whether in physical presence with managers or via AI-powered platforms like chatbots.

### 3 METHODS

To conduct a bibliometric analysis the methods were used in this study is to determine the research objectives along with their significance and data extraction.

#### **Formulation of research questions**

1. Examining a bibliometric analysis of HRM transformation through artificial intelligence publications that indexed in the Scopus database is the primary goal of this study. In order to achieve this goal, a few research questions have been formulated and these are:
2. Which are the leading countries in the publication of HRM and AI papers? It would be beneficial to know which nation is causing the greatest concern over HRM practices and support of AI according to researchers and practitioners. It will also provide opportunities to future research in that particular country or territory.
3. Which author and sources contributed more to HRM and AI based research? Identifying particular papers, techniques, and resources would make it easier for researchers to conduct excellent research on human resource management and artificial intelligence.
4. What is the top most publication Affiliations for human resource management and artificial intelligence papers? Having the right choices about conferences, universi-

ties, and journals to publish their research work in would be beneficial for respective researchers. It might have an impact on their paper's future citations.

What are the annual Trend of HRM and AI publications? Determining the yearly number of articles about human resource and artificial intelligence would be beneficial as it helps in anticipating the future trend.

6. Which subject area and document type published more research work on human resource management and artificial intelligence? It would be useful to distinguish between the various fields and document kinds where research on HRM and AI is being conducted. It will assist the investigator in determining potential avenues for future studies.
5. What is the keyword, citation and co-authorship network of human resource management and artificial intelligence? It will be an easy penetrating method for future researchers.

### 3.1 Data Extraction

It is crucial to use the right search engine for data extraction. For this reason, Scopus has been chosen. Elsevier's citation database, Scopus, is regarded as a notable index. It publishes excellent, peer-reviewed content. Scopus uses four different metrics to assess the quality of each title: the h-index, the Cite Score, the SCI Imago Journal Rank (SJR), and the Source Normalised Impact per Paper (SNIP). A total of 192 research publications on HRM and AI have been included in Scopus indexes. The present research study was selected between 2010 and 2024. This search was done on January 10, 2024. A total of 193 research papers were published during this period. The data is limited to the English language only, so the total number of research papers was 192. This search string was based on Scopus to search authors, top journals, subject area, document type, affiliations, and top countries.

## 4 RESULTS AND DISCUSSION

In this section, bibliometric analysis has been carried out with respect to each research questions.

### Distribution of Publication among Countries

This section analyzes the leading countries in the publication of HRM and AI papers (RQ1). It is important and helpful for the researcher to know the maximum number of publications with respect to the country that will provide opportunities for further study. According to the analysis of the top 15 countries and Figure 1, it is in the top position for publication with 78 documents. The United States (24) is in second place, and Australia is in third place with 20 documents, followed by the United Kingdom (19), China (17), France (10), and Germany (10).

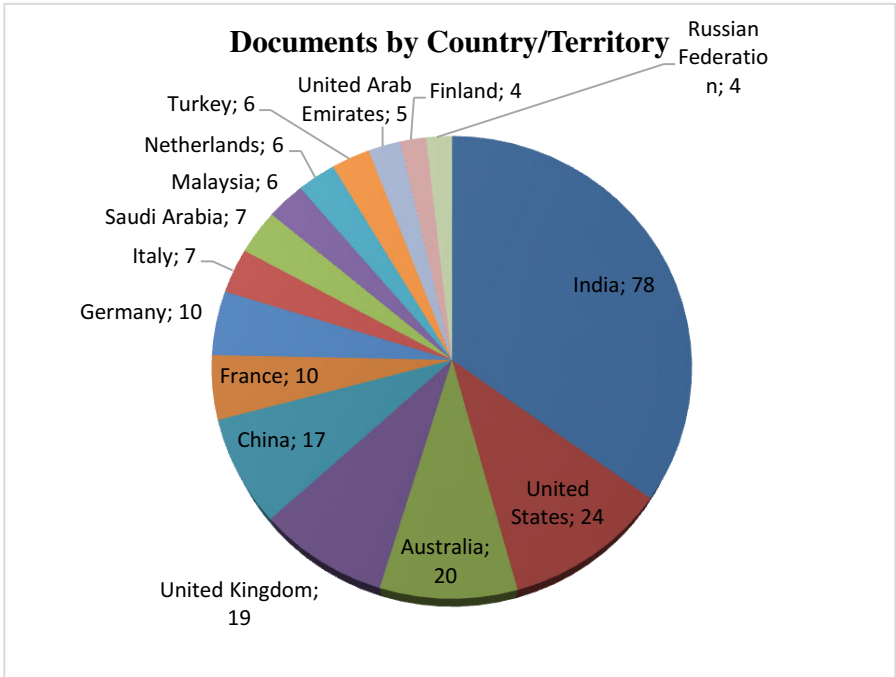


Figure 1: Documents by Country Territory

**Distribution of Author and Source**

This section examine the contribution of various author and sources like journal, lecture notes or dissertations to related to human resource and artificial intelligence (RQ2).

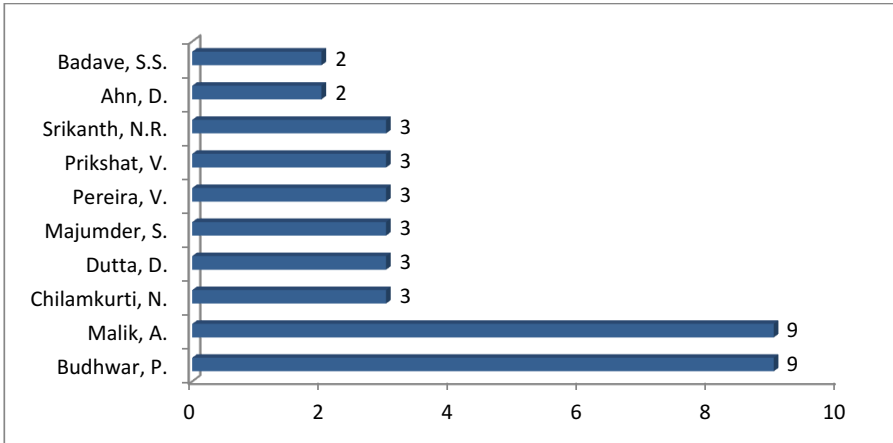


Figure 2: Documents by Author

Fig. 2 analyzes the contributions of the top 10 authors, and it was found that Budhwar, P., and Malik, A. published a maximum of nine works each on HRM and AI. Fig. 3 represents the maximum number of publications in journals, lecture notes, or dissertations. Adoption and Effect Of Artificial Intelligence on Human Resources Management Part A was at the top in the publication of papers related to human resource management, artificial intelligence, and the role of AI in human resources functions. The Human Resource Management Review journal and various available lecture notes in the related fields shared the same position. The International Journal of Human Resource, with five publications, secured the second-highest number, followed by the International Journal of Manpower, Personal Review, and Studies in Computational Intelligence, with three publications each. These data provide a pool of information which will assist researcher in the concerned field.

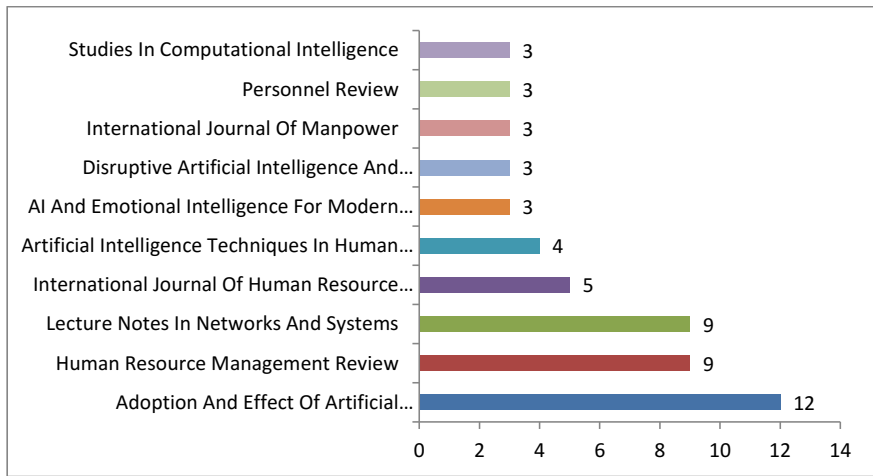


Figure 3: Document by Source Title

### Distribution of Affiliation

The top publications on affiliations with human resource management and artificial intelligence are covered in this section (RQ 3), which is based on the Scopus database. While comparing the top 15 affiliations at the global level, there are the most publications (10) on HRM and AI from the University of Newcastle, Australia. Aston University with nine publications and Aston Business School with eight publications are in second and third positions, respectively, as seen in Fig. 4. The data facilitates the concerned researcher in finding more opportunities to present and publish their work in collaboration with these affiliations.

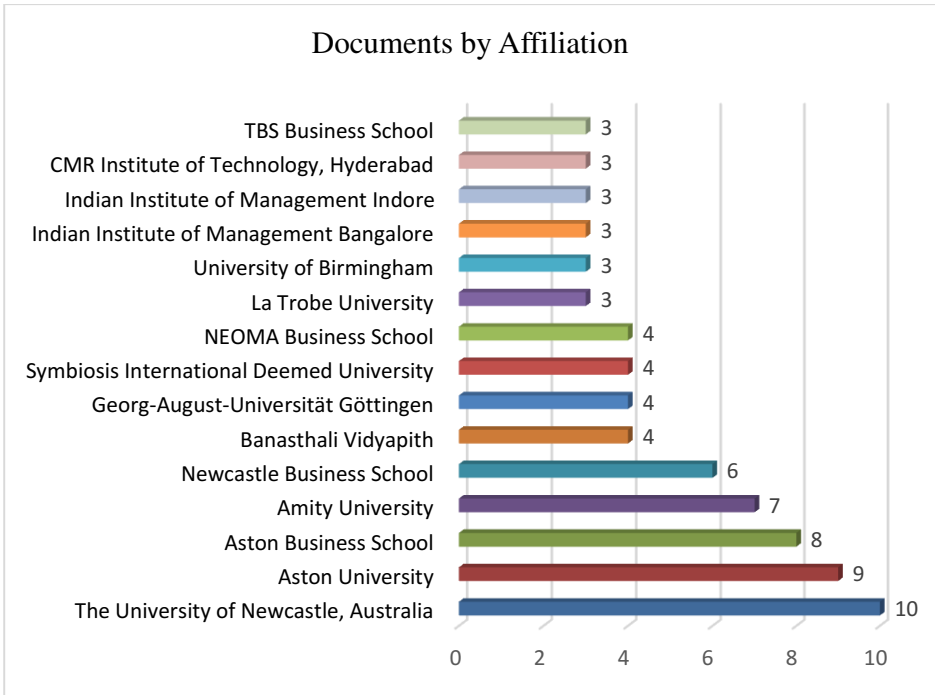


Figure 4: Documents by Affiliation

### *Distribution of Annual Trend*

Human resource management and artificial intelligence were analyzed with bibliometric tools in the present study. These trends show that the research area related to HRM as well as artificial intelligence and their significance have increased in the current framework (RQ 4). Fig. 5 shows the annual trend of HRM and AI publications, and the data represent that progressive growth only after the year 2018. There were 191 research papers and related articles published from 2010 to 2024, and only 1 paper was published in 2024 until January 16. The analyses depicted that the year 2023 had a maximum of 102 publications, followed by 35 in 2022, 20 in 2021, and 21 in 2020. The annual trend projected future research in related areas.



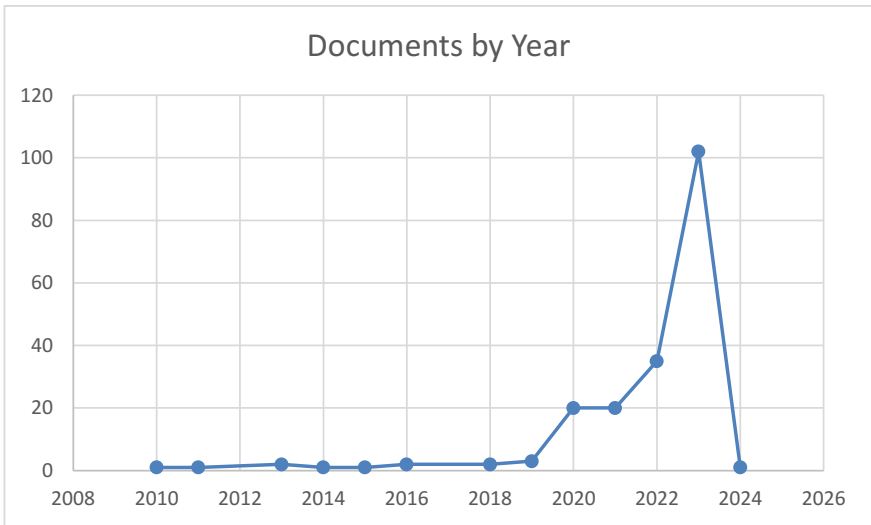
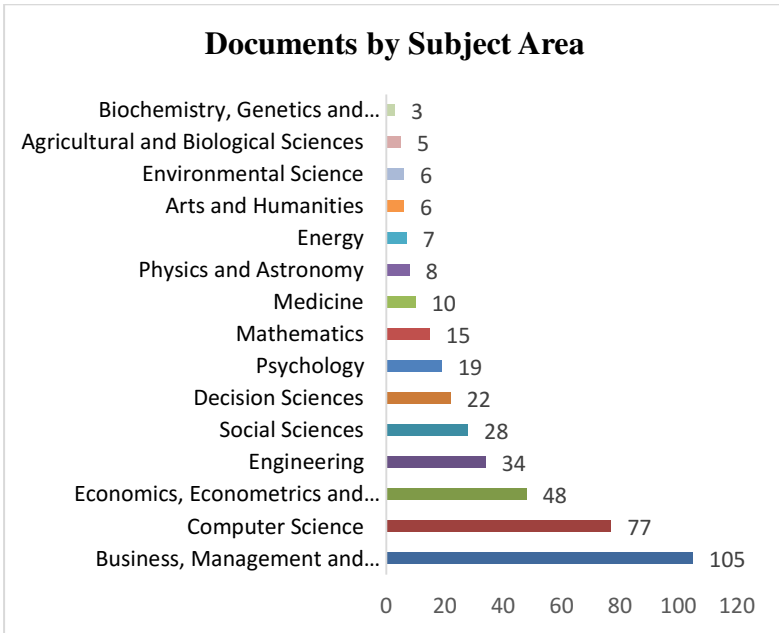


Figure 5: Documents by Year

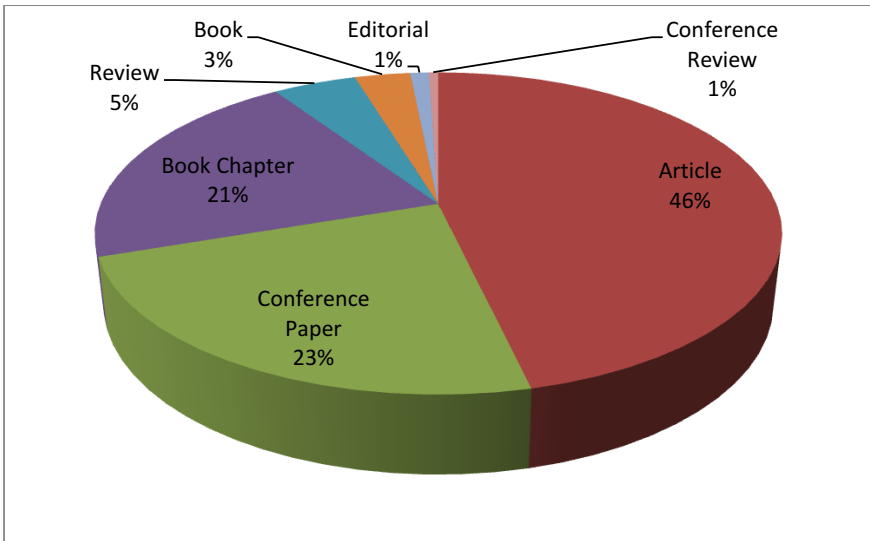
*Distribution of Subject Area & Document Type*

Fig. 6 shows that the top research and subject areas related to human resource management and artificial intelligence are ranked in business, management, and accounting with 34 publications, followed by computer science with 33 publications. Then, the top research areas in HRM and AI are engineering (16), economics, econometrics, and finance (15), social sciences (15), and decision sciences (10).



*Figure 6: Documents by Subject Area*

This part of the analysis deals with the types of documents published from 2010 to 2024 in the Scopus database. Fig. 7 shows that 46% (n = 89) of publications are in the form of articles. The other major contributions are from conference papers (23%; n = 45) and book chapters (21%; n = 40). The data gives a clear picture of document type, showing that 90% of documents covered by these three major parts rests 10% of document types are review (5%), book (3%), editorial (1%), and conference review (1%). The analysis provides the opportunity to conduct research to find out the scope of their publications in the related document type.



*Figure 7: Documents by Type*

**Distribution of Keyword, Citation and Co-authorship Analysis**

In this section, the network analysis has been done for keyword, citation, and co-authorship (RQ 6). The network analysis was an interpretation by the authors and was done with the help of VOS viewer, which is freely available online.

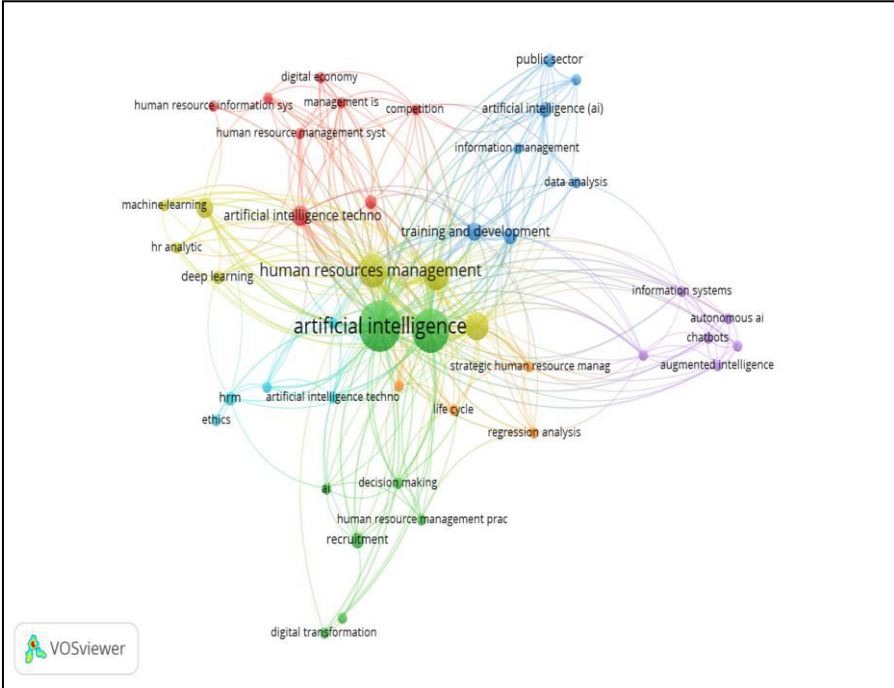


Figure 8: Keyword Network Analysis

Keyword network analysis (Fig. 8) shows that a total of 574 keywords were extracted, with 304 keywords at the minimum number of occurrences. The selected keywords are classified into seven clusters with different colours. Clusters 1 and 2 consist of a maximum number of items 8. Data illustrate that most researchers have found the keywords human resource management and artificial intelligence, followed by machine learning, decision-making, and resource allocation. Exploring the right keywords strengthens the study of the researcher.

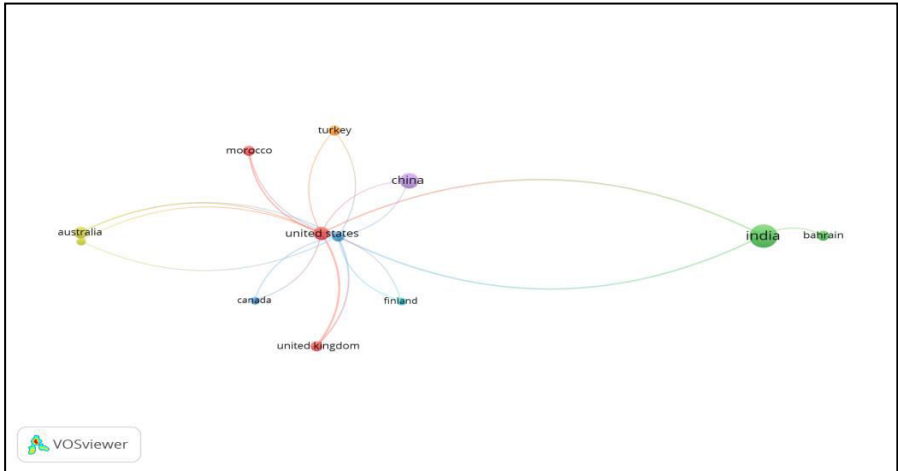


Figure 9: Citation Network Analysis

In the citation of the countries (fig.9), 12 meet the threshold among 35 countries, minimum 2 citation of the country counted in the present study. There are 7 clusters and India has maximum citation of 16 documents, China with 7 documents and USA with 5. The data demonstrate that human resource management and artificial intelligence are marking the high impact on research area in India, China and USA.

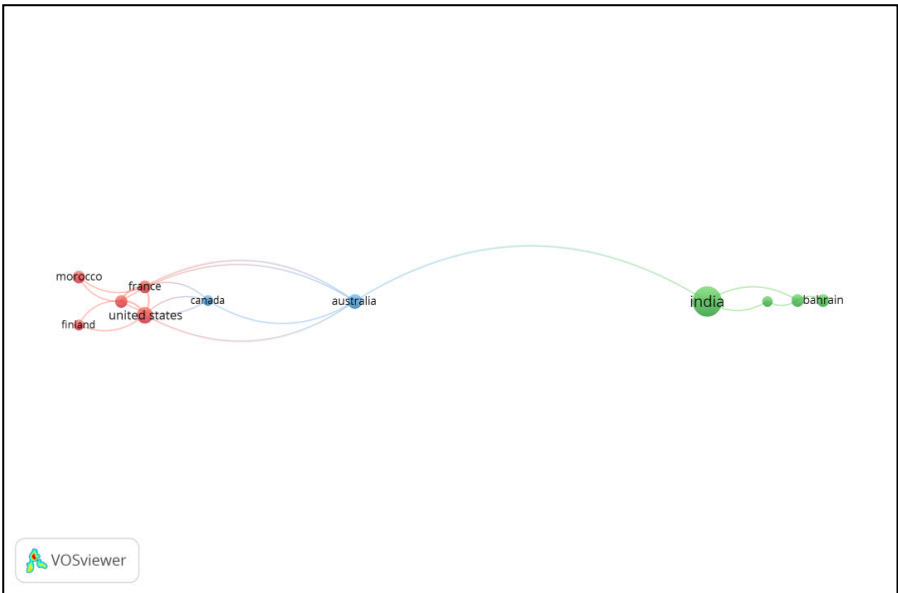


Figure 10: Co-authorship Network Analysis

Fig. 10 represents Co-authorship network analysis, which was done on the bases of countries. Out of 35 countries and threshold number of document of country were 2. There were 11 items with 3 clusters and the maximum items were in the cluster no. 1 having Finland, France, Morocco, UK and United States. Cluster 2 having Bahrain, India, Saudi Arabia and UAE. Cluster 3 having only Australia and Canada.

## 5 CONCLUSION

In this research, a bibliometric analysis of transformation of human resource through the adoption of artificial intelligence is presented. The study supported that artificial intelligence transform all the functions of HRM from man-power planning, recruitment, selection, performance appraisal, training & development to other related functions. 191 papers were retrieved from the Scopus database covering the 2010-to-2024-time span. It is found from the analysis that the interest of researchers in HRM and artificial intelligence was at a peak in 2023. After 2020, there was a random increase in publications on related topic. The top research area for human resource and artificial intelligence include Computer Sciences, Social Sciences and Economics, Econometrics and Finance, Business Management and Accounting contributed the most related publications. Most of the publications found on topic are in the form of articles, conference paper and book chapters respectively. Maximum research on HRM and AI published under the University of Newcastle Australia's affiliation. The India is at the top position for publication of a maximum number of papers with 78 papers followed by United States (24) and Australia (20). Co-authorship network analysis determines three clusters in the present study, which represent authors from India, Bahrain, Saudi Arabia, and the UAE who worked more collaboratively in comparison to authors from other clusters in Finland, France, Morocco, the UK, and the United States. Only 192 documents were found in Scopus database that reveal this area is not properly tapped, that offers huge opportunities for researchers in this area.

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