



“A Bibliometric Analysis of Human Resource Analytics Using Vosviewer and R Studio Bibliometrix”

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Abstract:

Purpose: HR Analytics is a growing topic and an area of interest for many researchers across India and worldwide. This study aims to emphasize collaboration among authors, universities, and countries in the area and, identify the most prominent authors, journals, universities, and countries to learn about the research challenges on which researchers are currently working in HR Analytics. **Methodology:** This study systematically examined the Human Resource Analytics study area by conducting a bibliometric study of 266 Scopus articles from 2012 to July 2023. We conducted a various analyses using VOSviewer and R Studio Bibliometrix.

Findings: The finding of the study shows that India, the US, Germany, and the Netherlands are the top countries in HR Analytics publications; collaborations between countries and universities focusing on HR Analytics are minimal. Angrave et al. and Marler and Boudreau were the most prominent authors.

Originality/ Value: The findings of this study provide valuable information to academicians, scholars and researchers to understand the research trends in Human Resource Analytics.

Keywords: HR analytics, Human Resource Analytics, Bibliometric analysis, VOSviewer, Biblioshiny.

1. Introduction

HR Analytics is a new term (Marler & Boudreau, 2017) and an emerging subject that enables HR to become a true strategic decision-making partner (Levenson, 2005). Because of the expanding strategic relevance of HR analytics for enterprises, as well as the acceptability of digital technological advances, the definition and technique of HR analytics have grown substantially over time (Margherita, 2022). HR Analytics is an HRM technique that aims to offer information to managers that links HRM procedures to workforce opinions and behaviors; and to enterprises' results (Marler & Boudreau, 2017). HR Analytics may assist supervisors and HR professionals in justifying, prioritizing, and improving HR expenditure (Ulrich & Dulebohn, 2015).

Human resource analytics are an essential step in evidence-based human resource management. Digitization in HRM practices provides us with a wider variety of data on workforce behavior and performance. Managing human resources and data management is a prime concern for enterprises. HR Analytics facilitates HR professionals to connect HRM practices with organizational outcomes and values, educate HR practitioners on data analyzing skills, and improve decisions through the use of robust knowledge and estimates. In summary, Human resource analytics can improve HR views and evidence. It is encouraging that academicians and practitioners are engage in HR analytics.(van der Togt & Rasmussen, 2017)

Human Resource Analytics began as a minor administrative undertaking and has steadily expanded to include advanced diagnostic and anticipatory skills (Edwards & Edwards, 2019) capable of increasing retention and engagement of employees and generating gains for entirety enterprises with technologically driven solutions for analytics (Deloitte,



2017).

HR analytics as a tool, not only generates benefits for organizations but also suggests predictive solutions for strategic decision-making. As large-scale data sets, digital technology, and dataanalytics methodologies have proliferated in human resource settings (Angrave et al., 2016; Chitra S. & Srivaramangai P., 2018; Edwards, 2018), demand for and the possibility of creating specialized human resource analytics skills has increased (Krscynski et al., 2018). Human Resource Analytics is becoming a more established field because of its demonstrated impact on corporate outcomes as well as a substantial impact on administrative and strategic choices.

For the literature analysis, the objectives of the research are:

1. Identify the most prominent authors, journals, universities, and countries;
2. Analyze the distribution of keywords and trends;
3. To recognize the co-citation network and bibliographic coupling among the authors; and
4. Diagnose the collaborations between universities and countries.

The study is summarized as follows: data collection and methodology; results of the bibliometric study including subject areas, document type, most cited articles, trending keywords, authors publications, affiliations and impact evaluation; and the findings of the bibliometric study as well as the conclusions.

2. Data Collection and Methods

2.1 Data Collection

For the bibliometric study, we utilized the Scopus database to extract metadata for the study because of the multidisciplinary and reliable database for abstracts and citations. Scopus is a leading source for databases and it's a part of Elsevier, that enables simple accessibility to scholarly articles and publications with peer review, such as Books, Conferences, short surveys, and notes. According to the Elsevier website, there are over 27,000 journals (more than 25,800 peer-reviewed) indexed on Scopus, with nearly 84 million publications receiving more than 1.8 billion citations (Elsevier, 2022). Based on the data presented above, the databases maintained by Scopus deliver top-notch accurate data for bibliometric study (Biancone et al., 2020).

The first search query was "HR Analytics" OR "Human Resource Analytics". This yielded 266 documents. Because we only wished to include English-language publications, we did not consider review papers. So, using the search query ("HR analytics" OR "Human Resource Analytics") AND (LIMIT-TO ("English")) AND (EXCLUDE ("re" OR "cr"))). This search criteria resulted in 236 documents. These documents were obtained from the database of Scopus as a comma-separated file (.csv).

2.2 Methodology

There are mainly two data analysis techniques i.e., performance analysis and science mapping (Donthu et al., 2021). The first addresses the contributions of research elements, while the second focuses on the interaction between research components (Donthu et al., 2021). The enrichment technique is another technique for analysis viz network analysis, that includes Network metrics, clustering, and visualization (Donthu et al., 2021).

Several studies were carried out using the tools Biblioshiny and VOSviewer. First, we obtained an annual scientific production graph and analysis of publication sources of the Scopus repository. The software Biblioshiny was used to determine the twenty top prominent authors, authors' local impact, journals, journals' local impact, universities, and countries. A similar tool was used for keyword analysis to generate the word theme map and most trend topics. The link between Affiliations, keywords, and journals was then investigated using a three-field plot. The VOSviewer was used for



analyzing the Co-authorship, Co-citation, Citation, Co-occurrence, and Bibliographic Coupling.

3. Results of the Bibliometric Analysis

The major bibliometric information for the Human Resource Analytics gathered using the Biblioshiny software is shown in Table 1. 236 documents were obtained from 171 sources, with original research articles (58.9% of all documents) and conference papers (27.1%). Book and book chapter constitutes (2.1% and 9.7%) respectively, and the remaining 2.2 % includes note and short survey.

Core Information

Description	Results
Key Information of data	Year
Period	2012:2023
Sources (journals, books, etc..)	171
Documents	236
Average No. of citations per document	11.06
Annual Growth Rate %	28.3
References	8959
Types of Document	
Article	139
Conference Paper	64
Book chapter	23
Book	5
Note	4
Short survey	1
Documents Content	
Keywords Plus	668
Author's Keywords	669
Authors	
Document with Multi-Authors	520
Document with Single-Author	34
Authors Collaboration	
Author with a single document	35
Co-Authors Document	2.64
Description	Results
Key Information of data	Year
Period	2012:2023
International Co-authors %	12.29

Table 1. Scopus, as interpreted by Biblioshiny

Annual Publications

The number of articles was insignificant in the early period from 2012 to 2015, after that the number of articles accelerated, and publication was highest in 2022 (as shown in Figure 1). Although a sluggish start, the yearly growth in the no. of articles picked up speed after 2016 and was slightly higher in the year 2017 compared to the next year till 2019, and subsequently started an acceleration that is maximum in 2022, which more than doubled in 2017 publications.

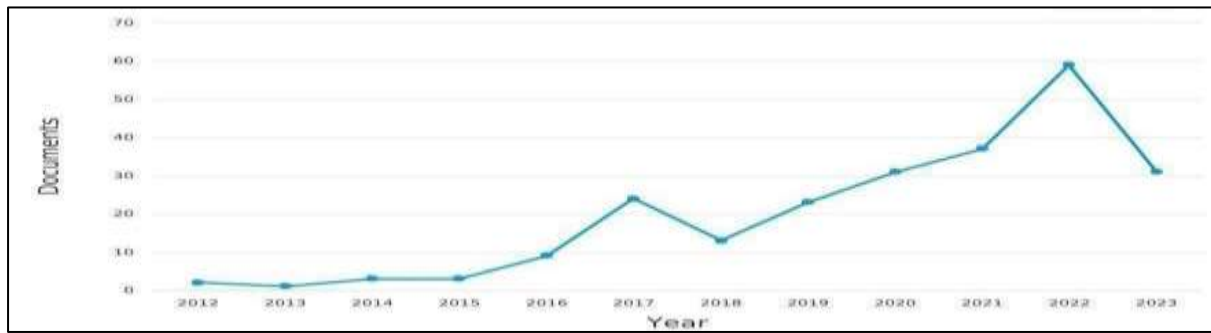


Figure 1. Scientific production year-wise. Source: Data analysis by Scopus

3.1. Publication Sources Analysis

3.1.1 Publication Subject Areas

The subject of Human Resource Analytics emerges as a diverse discipline and includes diverse areas, as shown in Table 2. The highest number of documents (29.7%) are from the main discipline of the concerned subject viz. Business, Management and Accounting, followed by Computer Science (19.1%), Engineering (13%) and others.

Subject Area	Documents	%
Business, Management & Accounting	132	29.7
Computer Science	85	19.1
Engineering	58	13.0
Decision Science	40	9.0
Social Sciences	26	5.8
Economics, Econometrics & Finance	23	5.2
Mathematics	18	4.0
Psychology	18	4.0
Medicine	13	2.9
Physics and Astronomy	9	2.0
Energy	5	1.12
Environmental Science	4	0.90
Agricultural and Biological Sciences	3	0.67
Arts and Humanities	3	0.67
Multidisciplinary	2	0.45
Nursing	2	0.45



Biochemistry, Genetics & Molecular Biology	1	0.22
Chemical Engineering	1	0.22
Materials Science	1	0.22
Neuroscience	1	0.22

Table 2. Source: Scopus, Analysis in Excel.

3.1.2. Publications Most Cited Sources

A minimum of two documents and five citations have been defined, as a criterion for analysis. 60 of the 171 sources match the criteria. The most cited is Human Resource Management Journal with 293 citations after that Journal of Organizational Effectiveness with 277 citations; International Journal of Human Resource Management with 270 citations; Human Resource Management Review with 205 citations; Management Science with 166 citations; and Organizational Dynamics with 129 citations. As seen in Figure 2, there is no connection between the sources, and Figure 3 represents the total citation index of the top twenty sources of publications in Human Resource Analytics.



Figure 2. Sources with the most citations. Source: Scopus, interpreted by VOSviewer



Figure 3. Local Impact of sources by Total Citation index. Source: Scopus, interpreted by Biblioshiny

3.1.3. Productive Sources

The analysis of the top 20 sources, with their documents, is presented in Figure 4. The top two most documented publication sources are the Journal of Organizational Effectiveness with 9 documents and the Human Resource Management Journal with 8 documents.

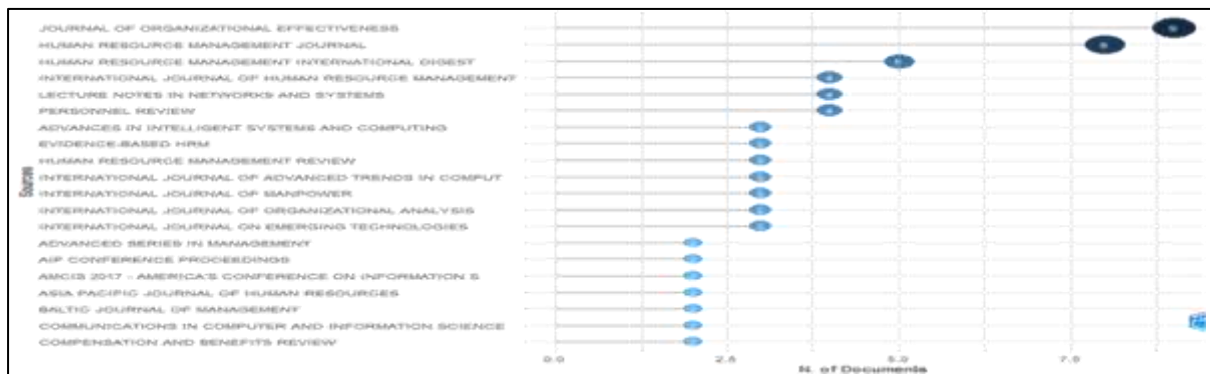


Figure 4. Top Twenty Sources of Publications. Source: Scopus, Biblioshiny interpretation

3.2. Documents Analysis

3.2.1 Top Cited Document

The top twenty documents with the highest total citations are presented in Figure 5. Angrave et al., 2016 with a maximum citation of 243, followed by Marler & Boudreau, 2017 with 214 citations, Ulrich & Dulebohn, 2015 with 168 citations, Aral et al., 2012 with 166 citations, and Rasmussen & Ulrich, 2015 with 129 citations.

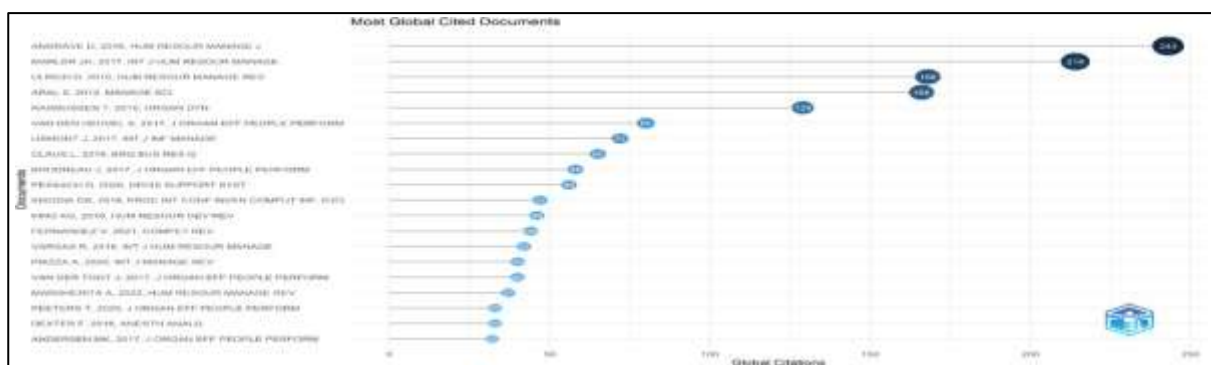


Figure 5. Top 20 cited documents. Source: Scopus, interpreted by Biblioshiny

Document citations of 20 have been specified as a criterion for analysis in VOSviewer. The documents with the largest link were selected, from which 34 papers out of 236 fulfill the criteria. Angrave et al., 2016 received the most citations (243), followed by Marler & Boudreau, 2017 with 214, Ulrich & Dulebohn, 2015 with 168, Aral et al., 2012 with 166, and Rasmussen & Ulrich, 2015 with 129. Figure 6 shows that there is no connection between the authors.

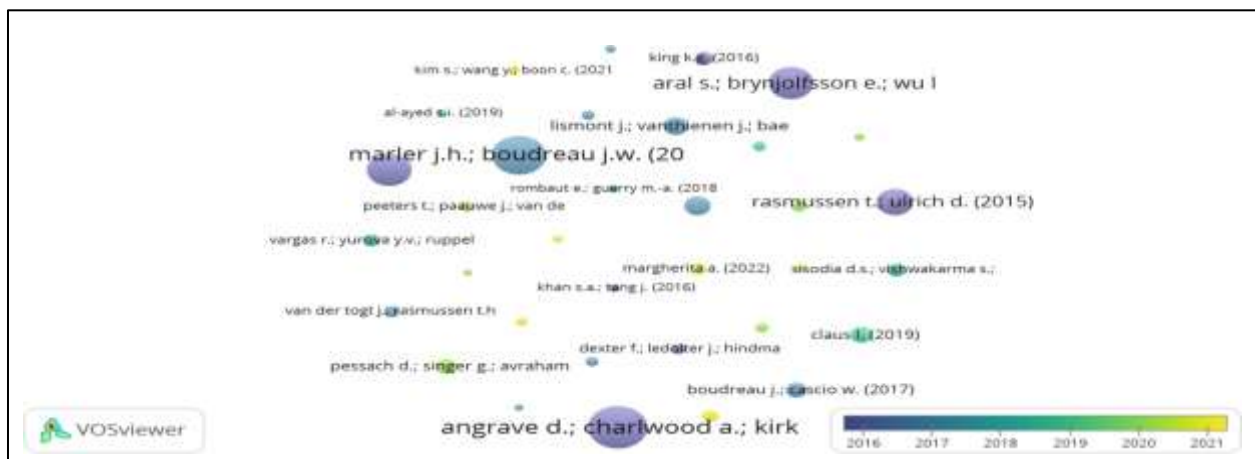


Figure 6. Most Cited documents. Source: Scopus, interpreted by VOSviewer



3.2.2. Documents Bibliographic Coupling

For analyzing the result, the ‘document’ was chosen as the basis of inquiry, and the method of fractional counting was applied. 10 citations of each document were set as analysis, 51 fulfilled the requirement out of 236 papers, and 36 of them connected. Angrave et al., 2016 had the most citations (243), followed by Marler & Boudreau, 2017 with 214 citations.

Six clusters were obtained, as shown in Figure 7, and details of clusters are presented in Table 3. The first and largest cluster, shown by the color red, had thirteen papers. Green colors present the second cluster, which consists of seven papers, the third cluster combines six documents in blue, the fourth cluster has five documents in yellowish brown, the fifth cluster has three documents in purple and the sixth cluster has two documents in sky blue.

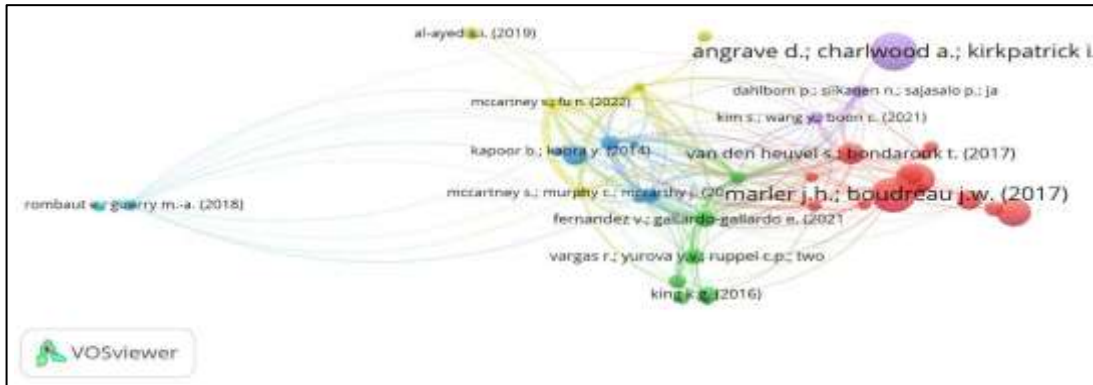


Figure 7. Documents Bibliographic coupling. Source: Scopus, interpreted by VOSviewer

Cluster	S. No.	Article	Citations	Links	Total link
1	1	(Boudreau & Cascio, 2017)	58	11	3
	2	(Cascio & Boudreau, 2014)	16	10	3
	3	(Claus, 2019)	65	11	2
	4	(Falletta & Combs, 2021)	21	22	16
	5	(Frederiksen, 2017)	24	2	1
	6	(Greasley & Thomas, 2020)	21	20	9
	7	(Marler & Boudreau, 2017)	214	14	9
	8	(Martin-Rios et al., 2017)	20	4	4
	9	(Rasmussen & Ulrich, 2015)	129	1	1
	10	(Ulrich & Dulebohn, 2015)	168	11	2
	11	(van den Heuvel & Bondarouk, 2017)	80	17	15
	12	(van der Laken et al., 2018)	18	19	6
	13	(van der Togt & Rasmussen, 2017)	40	5	4
2	1	(Ekawati Ardhianiswari D., 2019)	11	3	3
	2	(Fernandez & Gallardo-Gallardo, 2021)	44	24	30
	3	(Khan & Tang, 2016)	24	4	3
	4	(King, 2016)	46	6	4



	5	(Sharma & Sharma, 2017)	32	12	6
	6	(Shet et al., 2021)	27	24	27
	7	(Vargas et al., 2018)	42	16	8
3	1	(Belizón & Kieran, 2022)	10	16	11
	2	(Chatterjee et al., 2022)	16	16	11
	3	(Kapoor & Kabra, 2014)	17	2	1
	4	(Lismont et al., 2017)	72	5	3
	5	(Margherita, 2022)	37	21	33
	6	(Peeters et al., 2020)	33	17	14
4	1	(Al-Ayed, 2019)	24	3	1
	2	(Majumder & Mondal, 2021)	22	3	2
	3	(McCartney & Fu, 2022a)	12	20	37
	4	(McCartney & Fu, 2022b)	12	17	38
	5	(McCartney et al., 2021)	20	17	26
5	1	(Angrave et al., 2016)	243	1	1
	2	(Dahlbom et al., 2019)	30	22	14
	3	(Kim et al., 2021)	27	14	12
6	1	(Rombaut & Guerry, 2018)	21	13	6
	2	(Rombaut & Guerry, 2020)	18	1	4

Table 3. Documents Bibliographic coupling. Source: Scopus, interpreted by VOSviewer

3.2.3. Keyword Analysis

Figure 8 shows the results of an examination of the most commonly used terms and Figure 9 represents the twenty most used keywords in Human Resource Analytics. As seen in Figure 9, the author's most often used keyword is HR Analytics, with a frequency of 116 (34%). "Human Resource Analytics" and "Human Resources Analytics" have lower frequencies than HR analytics, with equivalent frequencies of 21 and 7(6% and 2%), indicating that HR analytics is the most prevalent. "People Analytics" and "Machine Learning" are followed by 24(7%) and 23(6.8%), respectively. "Artificial Intelligence" and "Big Data," are followed by 21(6%).



Figure 8. Word Cloud. Source: Scopus, Biblioshiny interpretation

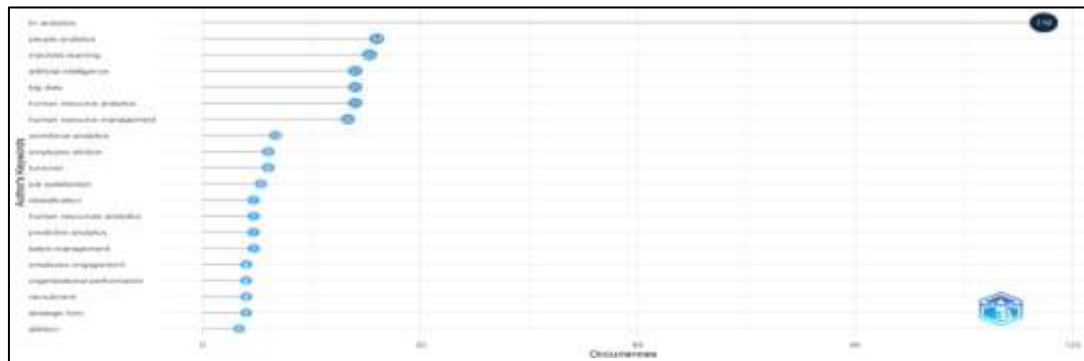


Figure 9. Keywords with occurrences. Source: Scopus, interpreted by Biblioshiny

For the co-occurrence analysis, all keywords were set as units of analysis, and keyword occurrences were set at 5. Out of 1173 keywords, 56 met the requirement. The total number of co-occurrence linkages with another keyword was computed, and keywords with the most overall links were chosen. According to the data, HR analytics is the most used keyword, with 116 occurrences and 220 total link strength (TLS), followed by human resource management (35 occurrences with 122 TLS), human resource analytics (34 occurrences with 109 TLS), machine learning (27 occurrences with 145 TLS), artificial intelligence (26 occurrences with 112 TLS), personnel (24 occurrences with 121 TLS), and people analytics (24 occurrences with 70 TLS). As seen in Figure 10, 56 keywords have been connected to form five clusters.

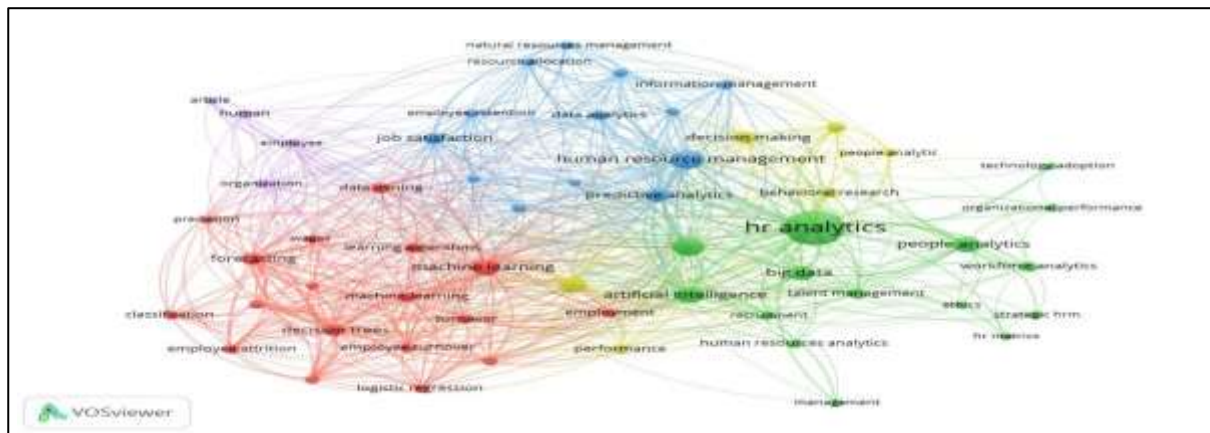


Figure 10. Most occurrences of keywords. Source: Scopus, interpreted by VOSviewer

3.2.4. Most trending topic The evolution of research publications on Human Resource Analytics over time-based on keywords is presented in Figure 11. In 2017, the keyword HR metrics was used 5 times. Human Resource Analytics and Workforce Analytics keywords were used in 2020 with frequencies of 21 and 10 respectively. HR analytics was used in 2021 with a frequency of 116, followed by machine learning and artificial intelligence with 23 and 21 times, respectively. People analytics is the most often used keyword in 2022 with 24 occurrences, followed by staff attrition with 9 occurrences.

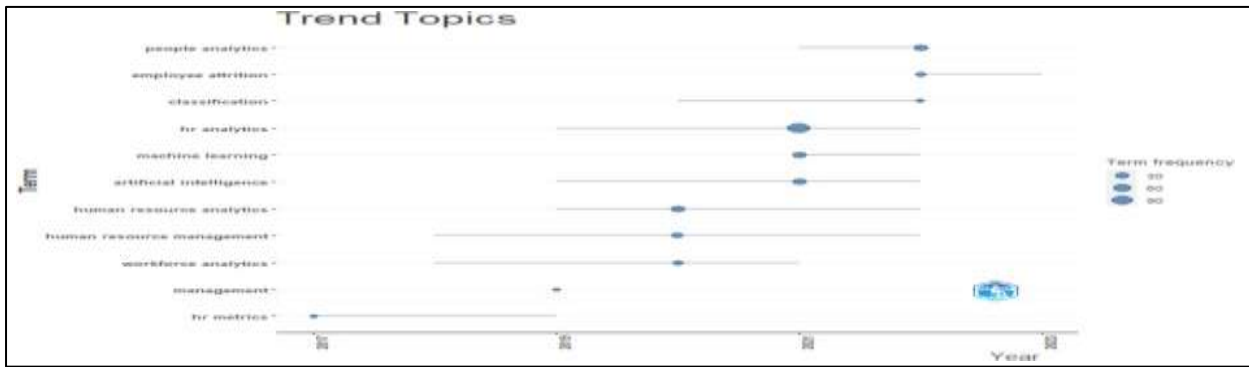


Figure 11. Trend Topics. Source: Scopus, interpreted by Biblioshiny

3.2.5. Thematic Map

Themes are the collection of keywords for keyword clusters by clustering algorithms. Keywords were chosen as a field for the analysis, and 60 words and Spinglass as a clustering algorithm were used as parameters. Figure 12 depicts a thematic map that categorizes themes into four quadrants. The two- dimensions for keyword clustering are development (density) and relevance (centrality) degrees, which may be organized into a single circle with four quadrants. “HR Analytics”, “People Analytics”, and “Big Data” are in the top right quadrant clusters as motor themes indicating that they are widely investigated and essential. The basic themes in the bottom right quadrant are “Machine Learning”, “Employee Attrition”, and “Turnover”. The niche themes are placed in the upper left quadrant whereas declining or emerging themes are in the bottom left quadrant. The four standard metrics for presenting the measurement of thematic clusters are Callon's centrality, and density; rank centrality, and density. Keywords in the form of thematic clusters are presented in Table 4. The Thematic clusters of Human Resource Analytics keywords publications are shown in Figure 13.

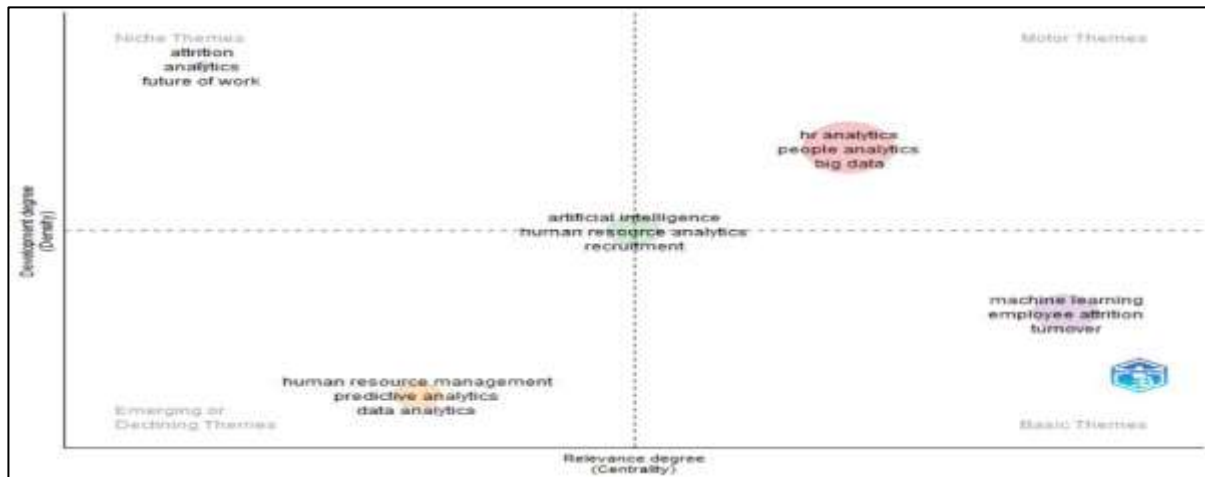


Figure 12. Thematic map representation of keywords. Source: Scopus, interpreted by Biblioshiny



Clusters	Callon Centrality	Callon Density	Rank-Centrality	Rank-Density	Cluster Freq.
HR Analytics	0.5371328593	36.18657596	4	4	248
Attrition	0.05	44.44444444	1	5	16
Artificial Intelligence	0.5073129252	35.46611237	3	3	67
Machine Learning	0.6400189786	29.55531045	5	2	97
Human Resource Management	0.2782936508	29.23015873	2	1	46

Table 4. Keywords thematic cluster measurement. Source: Scopus, interpreted by Biblioshiny

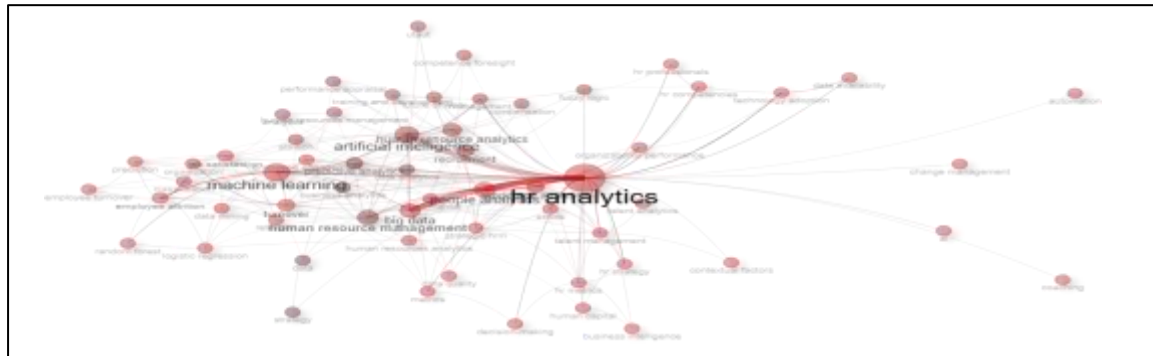


Figure 13. Thematic clusters of Human Resource Analytics Keywords. Source: Scopus, interpreted by Biblioshiny

3.3. Authors Analysis

3.3.1. The top productive and cited authors

Figure 14, demonstrates the top 20 productive authors. The twenty top relevant authors are Escolar-Jimenez CC, Gupta S, Gustilo RC, Matsuzaki K, Mittal A. and Singh S. with 5 documents each. They are followed by Arora M., McCartney S., Prakash A. and Saxena M. with 4 documents each on HR analytics.

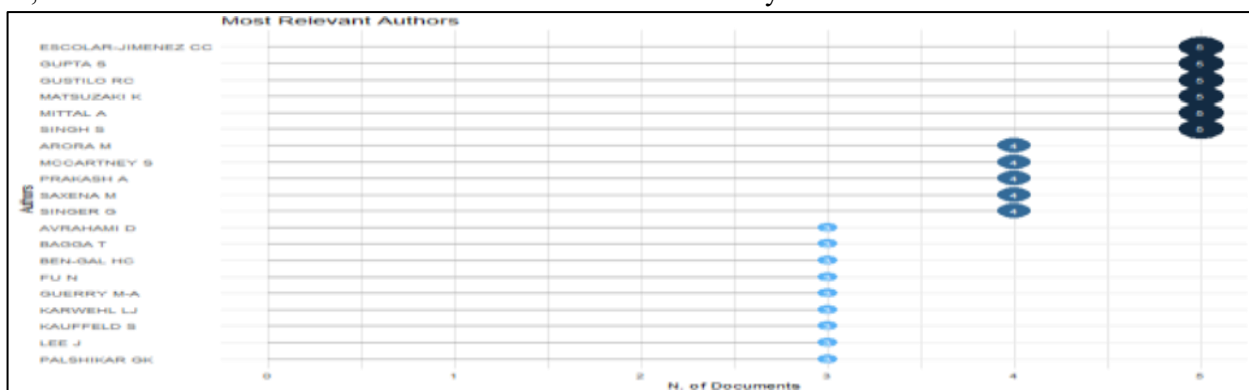
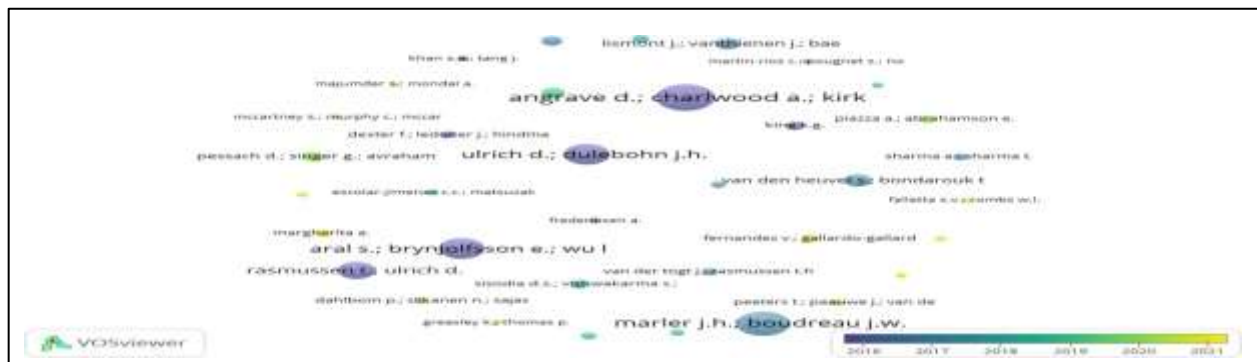


Figure 14. Top 20 most productive authors. Source: Scopus, interpreted by Biblioshiny

For analyzing this, a minimum no. of 1 document of an author and 20 citations has been set as a threshold. Out of 218 authors, 36 meet the threshold. The top cited are Angrave et al., 2016 with 243 citations, Marler & Boudreau, 2017 with 214, Ulrich & Dulebohn, 2015 with 168 citations, Aral et al., 2012 with 166 citations, and Rasmussen & Ulrich, 2015 with 129 citations. As we can see in Figure 15, none of the authors have been found to be linked together.



3.3.2. Author's H Index

In Figure 16, the twenty authors' local impact on the H index is shown. The top authors' local impacts are Escobar-Jimenez CC, Gustilo RC, and Matsuzaki K, with an H index of 4 each. They are followed by Guerry M-A, and McCartney S with an H index of 3 each on HR analytics.

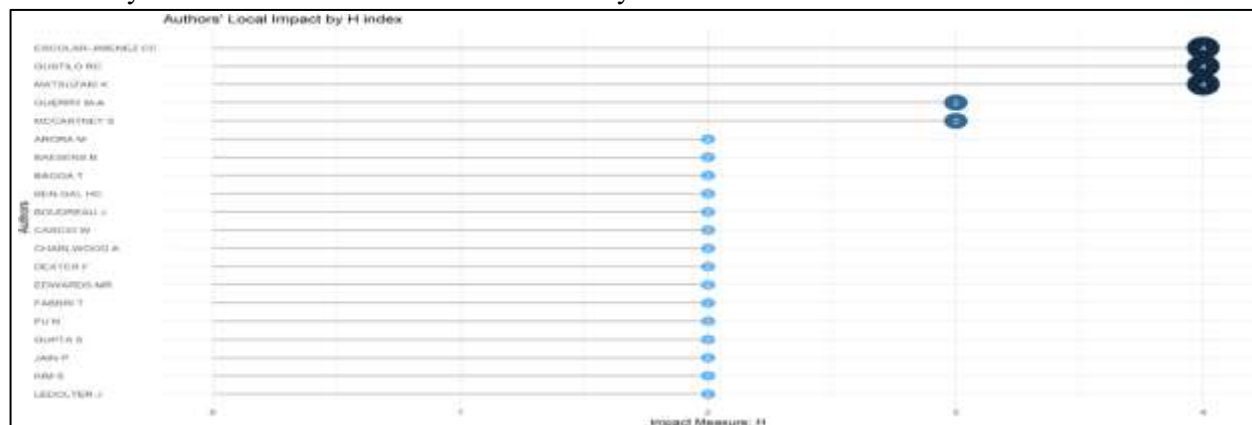


Figure 16. Local impact of top 20 authors. Source: Scopus, interpreted by Biblioshiny

The Top 20 author's production shown in Figure 17, depicts the author's actions that had the most influence within the provided period. The bubble size symbolizes the number of documents published in a particular year, and the degree of intensity of its color represents the number of citations in a year. Earlier, Palshikar G.K. published an article in 2015, 1 article in 2016, and one in 2019. Later on, in 2018, Escolar-Jimenez C.C., Gustilo R.C., and Matsuzaki K. published 1 article with 0.83 total citations per year. Guerry and Lee published 1 article in 2018 with 3.5 and 0.17 total citations per year respectively. In 2019, Escolar-Jimenez C.C., Gustilo R.C., and Matsuzaki K. published 4 articles with 6.8 total citations per year. In 2022, Mittal A. published 4 articles with 3 total citations per year followed by Singh S., Arora M., and Prakash A. with 3 articles and 3 total citations per year each. Gupta S published 3 articles with 1 total citation per year.

Furthermore, 87.7% of all authors produced only one HR analytics document (Table 5). Of all authors, 2.1% contributed three, and 1.2% published five documents.



No of written Documents	Authors	Authors proportions
1	456	0.877
2	42	0.081
3	11	0.021
4	5	0.010
5	6	0.012

Table 5. Author's Productivity. Source: Scopus, interpreted by Biblioshiny

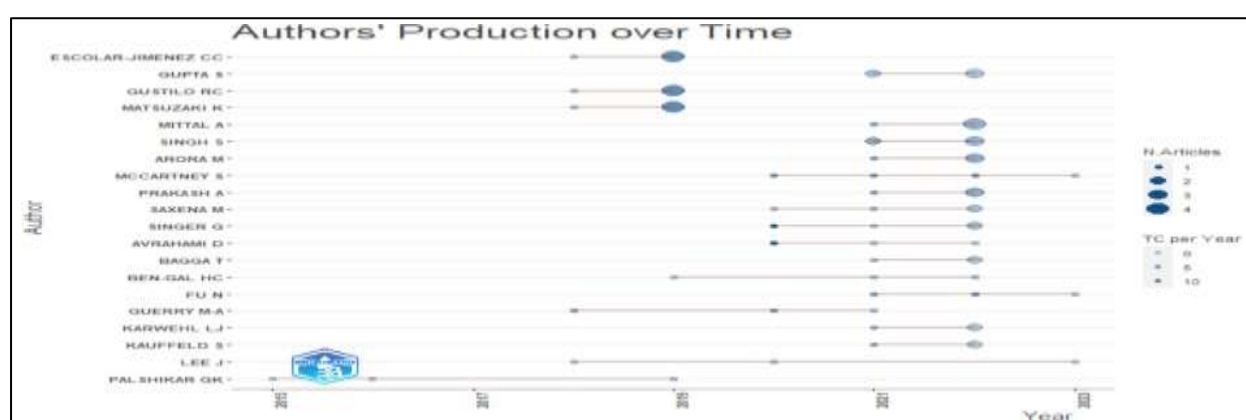


Figure 17. Author production over time with the top 20 authors. Source: Scopus, Biblioshiny interpretation

3.3.3. Co-authorship of Authors

For analyzing this, a minimum no. of 1 document of an author and 10 citations have been set as a threshold. The authors with the most overall link were chosen, out of 218 authors, 51 met the threshold. As we can see in Figure 18, none of the authors has been found to be linked together.



Figure 18. Co-authorship of authors. Source: Scopus, interpreted by VOSviewer



3.3.4. Co-citation of authors

For the analysis in VOSviewer, 50 citations of an author were selected as criteria. The authors with the most overall links were chosen, out of 12774, 17 met the threshold, and three clusters were formed. Figure 19 shows that Boudreau, Levenson, and Ulrich have the highest citations with 175, 132, and 116 respectively.

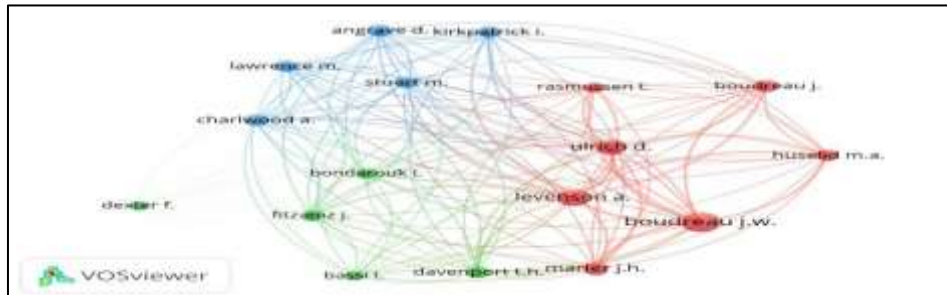


Figure 19. Authors Co-citation. Source: Scopus, interpreted by VOSviewer

3.3.5. Author's Affiliations

Figure 20 represents the twenty relevant affiliations of Human Resource Analytics. Amity University is the top institution with 14 articles followed by RMIT University with 11 articles. Tata Research Development and Design Centre, Tilburg University, and Vrije Universiteit Brussel with 7 documents each.

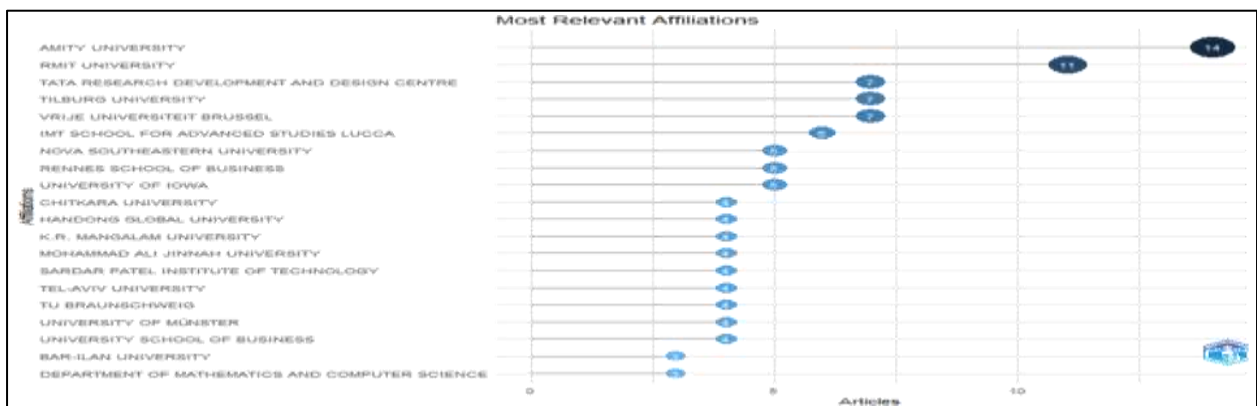


Figure 20. Top 20 most significant affiliations. Source: Scopus, Biblioshiny interpretation

3.3.6. Three-field plot

The three-field Figure 21, depicts the association between the top 20 authors, affiliations, and keywords. For the plot representation, the three main fields (affiliations, authors, keywords) of metadata have been selected. The plot keywords indicate the subject of the research, whereas the affiliations represent the author's connectivity with the universities. The height of every rectangle indicates connections of elements with others. The plot's left side depicts the keyword's relation with other elements; "HR Analytics" has the most links with the authors, followed by "artificial intelligence", "big data", and "machine learning". The right side of the plots shows the association of universities with other elements; from all the universities, the amity university is most affiliated with authors. The middle of the plot presents the author's connections with both elements; the most prominent authors of the study are Gustilo R.C., Escolar-Jimenez. C.C., and Matsuzaki K. and their contributions are found in similar publications.

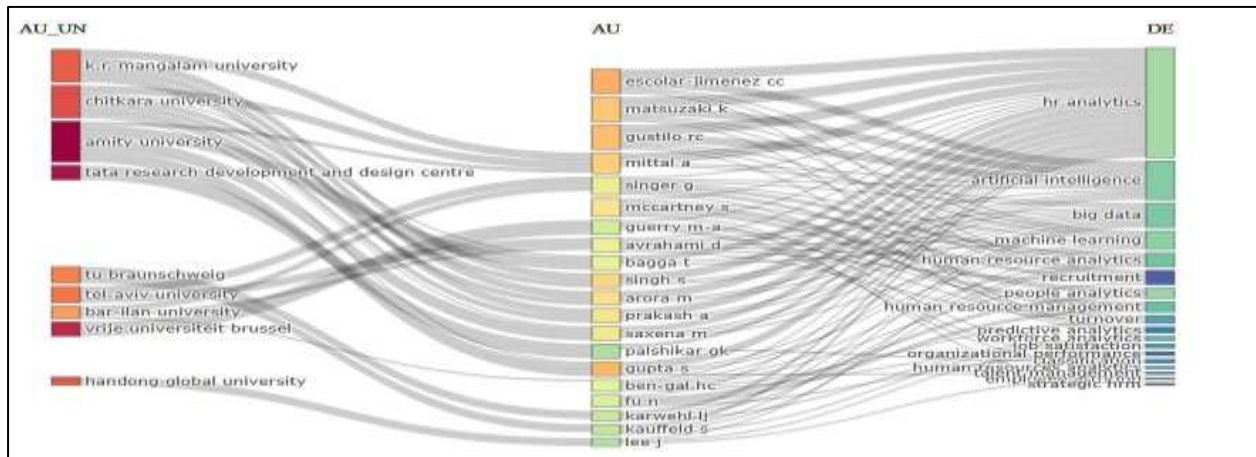


Figure 21. Three-field Plot (20 authors, affiliations, keywords). Source: Scopus, interpreted by Biblioshiny

3.4 Analysis of Countries

3.4.1. Countries Publications

This study looked at publication output in connection to the nations of the corresponding authors, as well as active engagement in Human Resource Analytics research. As seen in Table 6 and Figure 22, India led the way with 41 single-country publications, 2 multi-country publications, and the greatest frequency, 0.182 followed by the USA with 12 single-country publications, 2 multi-country publications, Germany with 12 single-country publications, 1 multi-country publication, and the Netherlands with 8 single country publications, 2 multi-country publications.

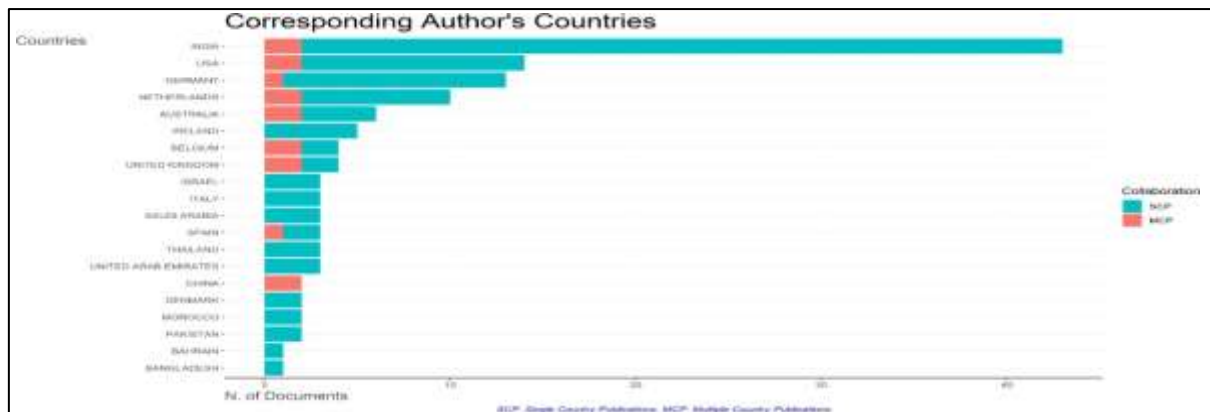


Figure 22. Countries Corresponding authors. Source: Scopus, interpreted by Biblioshiny

Countries	No. of Articles	Freq	SCP	MCP	MCP Ratio
INDIA	43	0.182	41	2	0.047
US	14	0.059	12	2	0.143
GERMANY	13	0.055	12	1	0.077
NETHERLANDS	10	0.042	8	2	0.200
AUSTRALIA	6	0.025	4	2	0.333
IRELAND	5	0.021	5	0	0.000
BELGIUM	4	0.017	2	2	0.500
UNITED KINGDOM	4	0.017	2	2	0.500
ISRAEL	3	0.013	3	0	0.000



ITALY	3	0.013	3	0	0.000
SAUDI ARABIA	3	0.013	3	0	0.000
SPAIN	3	0.013	2	1	0.333
THAILAND	3	0.013	3	0	0.000
UNITED ARAB EMIRATES	3	0.013	3	0	0.000
Countries	No. of Articles	Freq	SCP	MCP	MCP Ratio
INDIA	43	0.182	41	2	0.047
US	14	0.059	12	2	0.143
CHINA	2	0.008	0	2	1.000
DENMARK	2	0.008	2	0	0.000
MOROCCO	2	0.008	2	0	0.000
PAKISTAN	2	0.008	2	0	0.000
BAHRAIN	1	0.004	1	0	0.000
BANGLADESH	1	0.004	1	0	0.000

* SCP stand for Single Country Publication whereas MCP stands for Multi-country Publication

Table 6. Countries Corresponding authors. Source: Scopus, interpreted by Biblioshiny

3.4.2. Citation analysis of countries

For analyzing this, a minimum no. of 5 documents of country and 10 citations has been set as a threshold. The countries with the most overall links were chosen, out of 48 countries, 14 met the threshold. The United States with a maximum of 1092 citations followed by the UK (388 citations), the Netherlands (365 citations), India (305 citations) and Belgium (130 citations). However, we can see in Figure 23 no connections have been found between the countries.

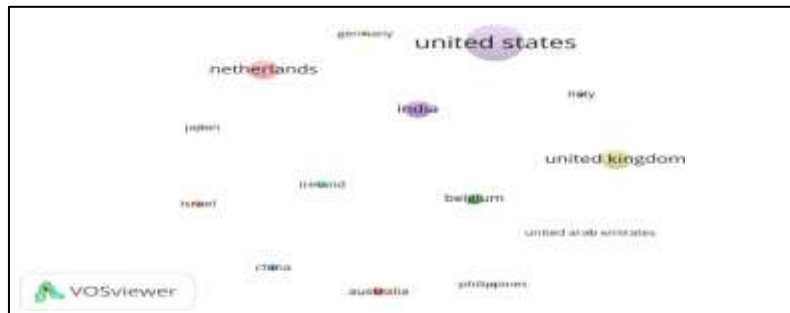


Figure 23. Most Cited Country. Source: Scopus, interpreted by VOSviewer

3.4.3. Countries Co-authorship Analysis

Figure 24 represents the Co-authorship analysis of Countries' analyses by setting a minimum of 5 documents and citations of the country as 20. 14 met the threshold out of 48 countries. From the 14 thresholds, the largest collection of associated countries consisted of 8 documents with 3 clusters. It depicts that the US, UK, Australia, and the Netherlands have the most author collaborations. The United States co-authored 33 documents with five other countries. The United Kingdom co-authored 11 documents with six other countries. The Netherlands co-authored 13 documents with four other nations, whereas Australia co-authored 9 documents with four other countries. It depicts that India publishes the most documents but co-authorship with only 3 countries.

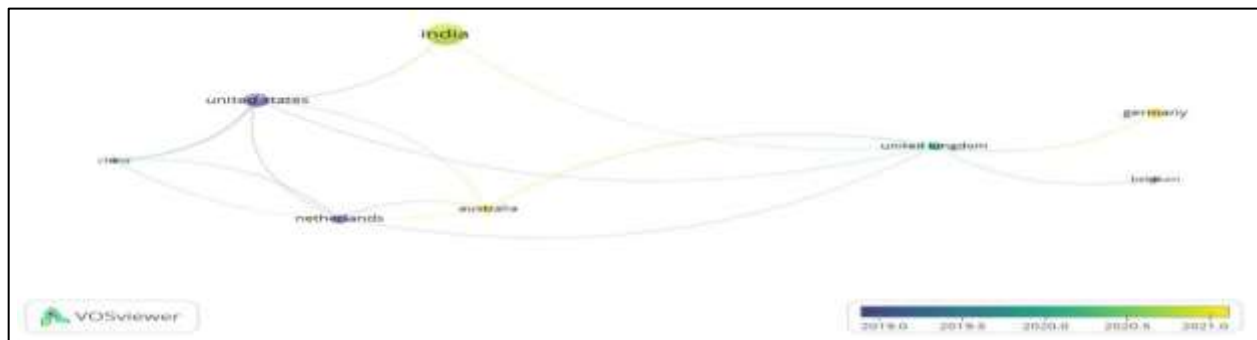


Figure 24. Co-authorship of countries. Source: Scopus, interpreted by VOSviewer

3.5. Organizations Analysis

3.5.1. Citation Analysis of Organizations

For analyzing this, a minimum no. of 2 documents of an organization and 10 citations has been set as a threshold. The organizations with the most overall links were chosen, out of 380 organizations, 10 met the threshold. From all the organizations Tokyo City University, Japan has published 5 documents with 39 citations. De la Salle University, Philippines (21 citations); Maynooth University, Ireland (25 citations); and University of Dublin, Ireland (25 citations) have published 3 documents. De la Salle University, Philippines (18 citations); Tilburg University, Netherlands (26 citations); University of Limerick, Ireland (30 citations); University of Southern California, US (74 citations); NMIMS University, Mumbai, India (30 citations); and Sastra University, Thanjavur, India (10 citations) has published two documents.

All top cited organizations with 1 document are ‘Independent Strategic HR Analytics Consultant’, United Kingdom; Leeds Institute for Data Analytics, Leeds University Business School, United Kingdom; Leeds University Business School, UK; University of Sheffield, UK; and Loughborough University, UK with maximum 243 citations followed by the University of Southern California, CA, US; Massry Center for Business, University, Albany, US with 214 citations. However, no connections between organizations have been found in the analysis, which can be seen in Figure 25.



Figure 25. Most Cited Organization. Source: Scopus, interpreted by VOSviewer

3.5.2. Organizations Co-authorship Analysis

For the analysis, documents of the organization have been set as 1 and citations as 10. Out of 380 organizations, 96 meet the thresholds. The largest set of connected items has taken, which consists of 5 items with 1 cluster. As we can see in Figure 26, two from India, management studies, NITIE, Mumbai, and Computer Science and Engineering IIT Kharagpur. Two from Greece, the Hellenic Open University, Patra; and the University of Athens. One from the University of Nicosia, Cyprus.

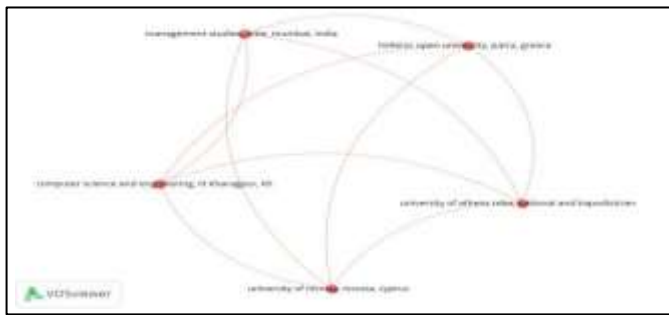


Figure 26. Co-authorship analysis of the organization. Source: Scopus, interpreted by VOSviewer

4. Discussions and Conclusion

A Bibliometric study in the area of HR analytics was conducted using the Scopus database of 236 published documents between 2012 and July 2023. The metadata was analyzed using VOSviewer and R Studio Bibliometrix. We have conducted a quantitative analysis of the metadata on Human Resource Analytics to identify the output by year, author, university, country, publication, and research topic.

The increasing number of publications in recent years, particularly in 2022, reflects the topic's growing prominence. India, the USA, Germany, the Netherlands, and Australia are the most producer countries of publications while the most cited countries are the USA, the UK, the Netherlands, India, and Belgium. The findings of the study show that India is the top producer among the countries that have published more papers. It is also among the 5 most prominent countries. However, we noticed that while the UK is one of the top five most famous countries, it is not one of the most prominent five countries in the case of paper production.

The USA, UK, Australia, and the Netherlands have the highest collaborations among authors. Even though India is the most document publisher country but collaborated with only 3 countries. Indian authors should make efforts to collaborate with other countries to strengthen their position in the international scenario.

The most productive university among all the universities is Tokyo City University, Japan. In India, NMIMS University, Mumbai, and Sastra University, Thanjavur are among the top 10 universities in publishing documents, but they are not the most cited. The most cited are from the UK and the USA. In the United Kingdom, an Independent Strategic HR Analytics Consultant, Leeds University Business School, University of Sheffield, and Loughborough University are the most cited. In the United States, the most cited are the University of Southern California, and Massry Center for Business, University at Albany.

Collaborative organizations are Management Studies, NITIE, Mumbai, India; Computer Science and Engineering IIT Kharagpur, India; Hellenic Open University, Patra, Greece; University of Athens, Greece, and the University of Nicosia, Cyprus.

The Journal of Organizational Effectiveness and the Human Resource Management Journal demonstrate academia's great interest, and these are the most cited sources.

The analysis of keywords indicates that the most often utilized words include "HR analytics", "People analytics", "Machine Learning", "Artificial Intelligence", and "Big Data". Furthermore, the bibliometric study found that the authors Escolar-Jimenez C.C., Gustilo RC., Matsuzaki K., Mittal A., and Singh S., are the most indexed. Escolar-J. CC, Gustilo RC, and Matsuzaki K. are also the most productive authors, while Mittal A., Singh S., Arora, McCartney S., Prakash A., and Saxena M. belong to the top 20 most published authors. They are, however, not the most cited. Angrave et al., 2016, Marler & Boudreau, 2017, Ulrich & Dulebohn, 2015, Aral et al., 2012, and Rasmussen & Ulrich, 2015 are among the most cited and prominent. The study also indicated that the Authors are linked with major universities such as Amity University, RMIT University Australia, Tata Research Development and Design Centre, Tilburg University, and Vrije Universiteit Brussel.



Furthermore, in the data search, we only utilized the phrases, "Human Resource analytics" and "HR analytics" although terms like "People analytics," "Workforce analytics," and others might be utilized to widen the area of the search. Though employing synonymous keywords may yield a more accurate database in the research area, the findings demonstrated that our Scopus database is adequate because it covers all important components of Human Resource Analytics. The analytical results presented in this article provide an outline of the Human Resource Analytics topic. The study's findings will assist academicians and scholars in conducting systematic literature reviews and identifying the most significant authors, publications, and journals.

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