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Integrating bibliometric analysis and systematic literature review to explore HR analytics: A methodological convergence

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Abstract

Human resource analytics, or HRA, has emerged as a strategic tool for coordinating people strategies with organizational objectives in the age of data-driven decision-making. The development, themes, and applications of HRA are mapped in this paper through the integration of Bibliometric Analysis and Systematic Literature Review (SLR). Biblioshiny and VOS viewer were used to analyze 82 articles using PRISMA (Moher et al., 2009). The results showed that after 2015, there was a rapid increase, with Europe, the USA, and India leading the way. Strategic decision-making, talent management, and predictive analytics are high-impact topics. Five major clusters are synthesized by the SLR, which is guided by the 5W1H framework (Callahan, 2014) and includes strategic alignment, operational efficiency, decision support, ethical challenges, and theoretical development. There are still gaps in the research on ethical governance, expanding to emerging markets, and connecting HRA to financial performance. This study makes a theoretical and practical contribution by providing a systematic road map for furthering research and assisting HR executives in using analytics to drive strategic change.

Keywords: HR analytics, human resource analytics, workforce analytics, people analytics, talent analytics, human capital analytics

Introduction

HR analytics is also known as ‘work force analytics’, ‘human capital analytics’, ‘HR analytics’ or ‘people analytics’ in the literature (Zeidan & Itani, 2020) [73]. HR analytics facilitates Evidence-based human resource decision-making. HRA is defined as “an HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and to enable data-driven decision-making.” Historically, HR functions were limited to administrative duties like hiring, training, performance appraisals, and employee relations. With globalization, technological advancements, and changing workforce dynamics, HR has evolved into a strategic partner Human Resource Analytics embodies this shift by incorporating data-driven approaches into HR decision-making. HR Analytics helps find trends, forecast workforce trends, and match human capital plans with company objectives by using statistical models, machine learning, and visualization tools. HRA has been quickly adopted by businesses, but research is still dispersed among fields with different conceptual frameworks, terminologies, and methodological techniques. In order to fill that gap, this paper combines systematic literature review (SLR) with bibliometric analysis. Through the 5W1H framework (Who, What, When, Where, Why, How), the SLR enables thematic synthesis, whereas bibliometrics offers a macro-level mapping of intellectual structures. These methods collectively unveil the theoretical underpinnings, thematic evolution, and new boundaries of HRA. By providing a systematic roadmap for furthering research and assisting HR leaders in utilizing analytics for strategic transformation, this study makes a significant academic and practical contribution. Data has evolved into a strategic asset as a result of digital transformation, changing how businesses handle their human resources. Employers can now better understand employee behavior, predict trends, and increase effectiveness by using Human Resource Analytics (HRA) to support evidence-based hiring, performance management, retention, and workforce planning decisions. The HRA literature is still

fragmented, with a variety of terminologies, uneven development, and cross-disciplinary approaches spanning organizational studies, data science, and HRM, despite growing interest from academics and practitioners. As a result, fundamental questions remain unanswered:

- Which ideas predominate in HRA research?
- How has the field changed over time?
- Which techniques and resources are most frequently employed?
- What knowledge gaps still exist?

Therefore, mapping the field's foundations, intellectual advancements, and future research directions requires a methodical synthesis. This study uses a combined Bibliometric Analysis and Systematic Literature Review (SLR), guided by the PRISMA protocol, to provide a methodical and thorough overview. By doing this, it advances HRA as a cohesive and developing field and helps to bring the disparate literature together.

The study aims to address the below mentioned research questions:

- **RQ1:** What is the present status of scholarly research in the discipline of human resource analytics?
- **RQ2:** Which articles and journals have the greatest sway in this field?
- **RQ3:** Which nations and authors contribute the most to HR Analytics research?
- **RQ4:** How do the systematic literature review (using the 5W1H framework) and bibliometric data work together to give us insights into HR analytics?
- **RQ5:** What are the understudied topics and research gaps that exist today, and what directions should future studies pursue?

Research Objectives

1. To guarantee methodological rigor and openness, a systematic review of the body of existing literature on HR analytics will be conducted utilizing the 5W1H paradigm.
2. To provide a comprehensive grasp of the field's current condition, conceptual boundaries, and methodological methods by combining insights from the systematic literature review and bibliometric analysis.
3. To find out current gaps, understudied topics, and possible avenues for additional academic investigation in order to suggest future research 'agenda.

Data and methodology

Data collection

Scopus, owned by Elsevier, offers structured metadata suitable for bibliometric analysis and thorough coverage of peer-reviewed literature in the fields of technology, management, and business, it was selected to gather data (Cobo et al. 2011) [14]. The following are the steps taken:

Key Words: "HR analytics," "human resource analytics," "workforce analytics," "people analytics," "talent analytics," or "human capital analytics." These publications cover HR analytics, its applications, concepts, evolution, and associated topics. According to Moher et al. (2009) [41], 266 papers were included in the bibliometrics study, and PRISMA was used for additional screening in the Systematic Review. Using a document search tool, a corpus of pertinent publications on HR Analytics was compiled.

(1) A search thread created and compiled by a cluster of the

subject (Business, Management and Accounting; Psychology; Economics, Econometrics and Finance) and research strategies (bibliometric, literature review). (2) The search bar contains "article title, abstract, and keyword" for the broader perspective.

(3) Document type and publication stage "article", "review" and "final," respectively.

(4) Language in "English."

Table 1: Displays the collected database's structure (CAGR- Compound Annual Growth Rate, DAA- Document Average Age, ACPD- Average citations per document).

Description	Output
Period	2008-Mid
	2025
Sources (Journals)	134
Documents	266
CAGR %	19.6%
DAA	3.62
ACPD	30.74
Document Contents	
Index Keywords	333
Author's Keywords (DE)	800
Authors	
Authors	589
Authors of single-authored docs	40
Collaborations of Authors	
Co-Authors per Doc	2.61
International co-authorships %	21.43
Type of Documents	
Article	238
Review	28

Source: Biblioshiny

Analysis of data

An Excel spreadsheet was prepared including all the bibliometric information relating to the papers. (P. Mishra & K. Kumar, 2023) [40]. Everyone can identify current trends and potential research directions, thanks to bibliometric analysis (Li et al. 2017) [33]. The bibliometric analysis was carried out using the following instruments:

- **Biblioshiny (R package):** For analyzing descriptive statistics.
- **VOSviewer:** For network visualizations like maps showing the co-occurrence of keywords.
- **Microsoft Excel:** For frequency counts, data cleaning, and creating a 5W1H coding sheet. The intellectual framework and thematic development of HR Analytics research were robustly and aesthetically richly analyzed thanks to these tools. Fig. 1 represents the flow of the bibliometric analysis.

Screening Process using The PRISMA model

To find out the latest trends in HR analytics, we conducted a systematic literature review using the PRISMA Protocol (Page et al., 2021) [47]. The goal of the evidence-driven minimal checklist known as PRISMA is to help researchers improve the caliber of reporting in systematic reviews and meta-analyses (Ferenhof et al. 2015; Cacciamani et al. 2023; Nguyen and Nguyen 2023) [20, 10, 45]. It contains a flowchart to help with the systematic literature review's identification, screening, eligibility, and inclusion procedures analyses (Moher et al. 2016; Narang et al. 2023) [42, 43]. The PRISMA model also seeks to ensure the objectivity, accessibility, and confirmability of bibliographic research by efficiently organizing, locating, and assessing the literature in order to extract and synthesize data from the study. Research (Page et al. 2021; Haddaway et al. 2022) [47]. Fig. 2 illustrates the PRISMA protocol.

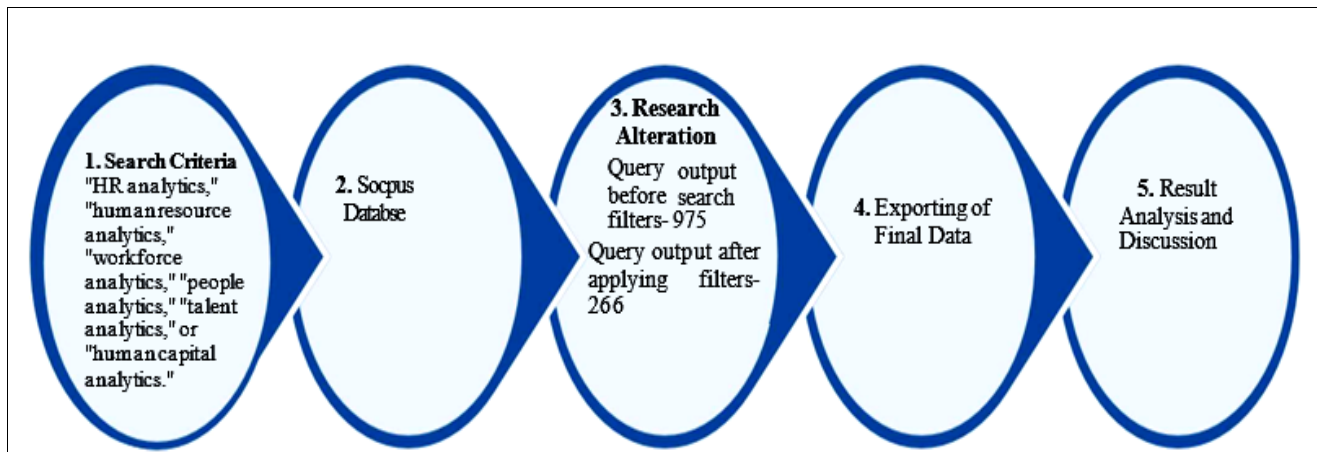


Fig 1: Flow of the Bibliometric Analysis (P. Mishra & K. Kumar, 2024) ^[40].

Data Extraction & Coding (5W1H Framework)

For the Systematic Literature Review, a structured data extraction sheet was developed in Microsoft Excel based on the 5W1H framework, categorizing each selected study according to:

- **Who:** Stakeholders or specific people or group relevant to the issue or the situation.
- **What:** Key themes, concepts, constructs, and variables studied.
- **When:** Information on the problem's duration, including dates, deadlines, and other time-related factors.
- **Where:** Geographical and application contexts.
- **Why:** Research aims and purpose.
- **How:** Methodologies and analytical techniques employed

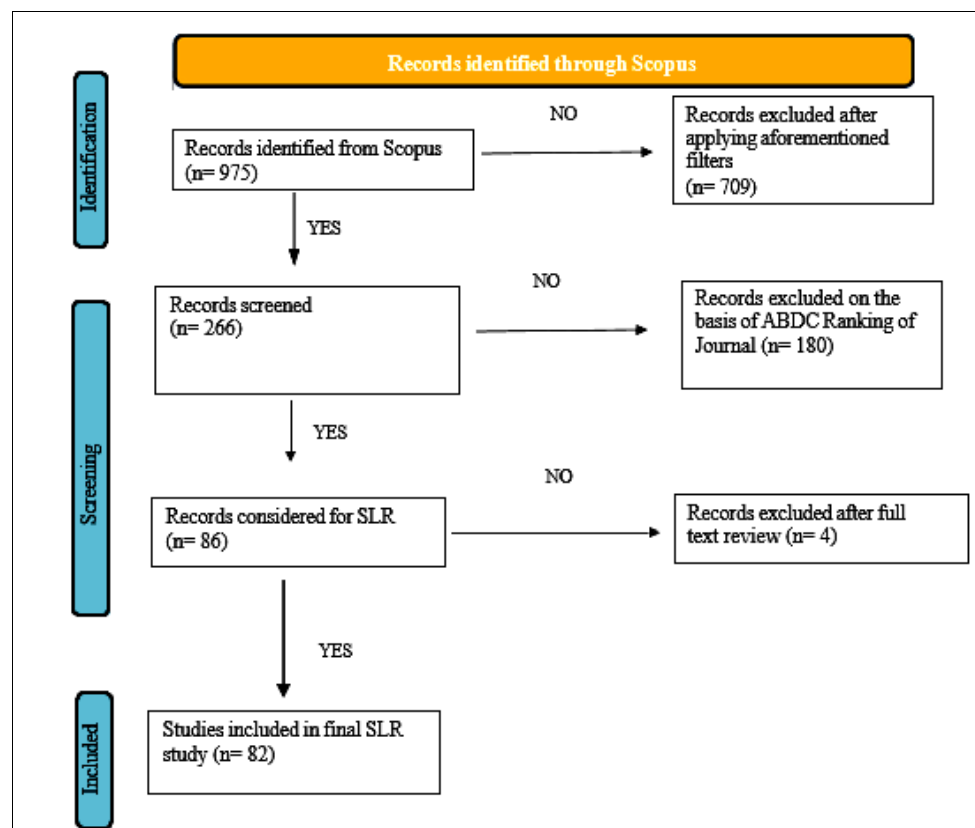


Fig 2: PRISMA protocol.

Bibliometrics analysis

Annual Scientific Publication Trends

Even after getting much exposure, HR Analytics is still hotter! The publishing trend in HR Analytics shows a consistent increase in scholarly contributions over time, suggesting that this topic is becoming more and more popular among academicians and practitioners. The trend

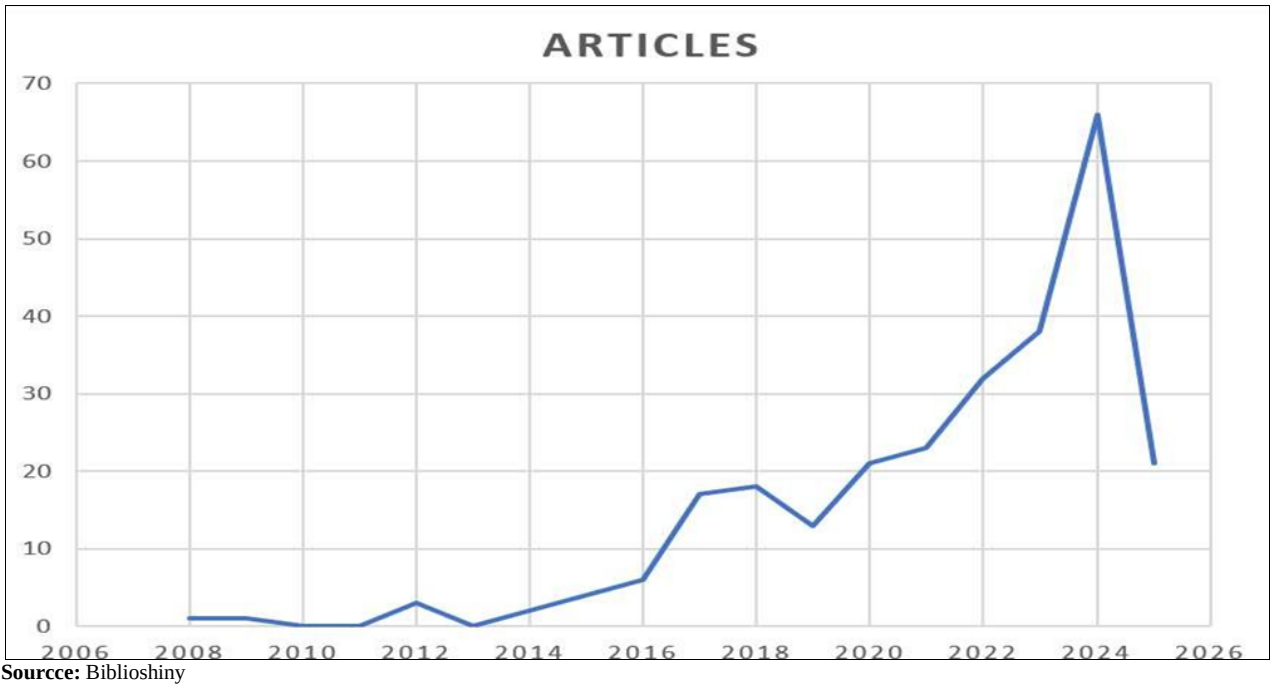
exhibits a clear upward trajectory from 2014 to 2024, as per the data the first article got published in 2008, still it was post-2015 the publication saw a notable surge. The maturity and applicability of HR Analytics in workforce and organizational studies are demonstrated by the notable growth in research output in recent years. Hence, the data proves that the topic is gaining momentum year by year.

Integrating Bibliometric Analysis and Systematic

Table 2: Annual Scientific Publication

Year	Articles
2008-2014	7
2015	4
2016	6
2017	17
2018	18
2019	13
2020	21
2021	23
2022	32
2023	38
2024	66
2025	21

Source: Biblioshiny



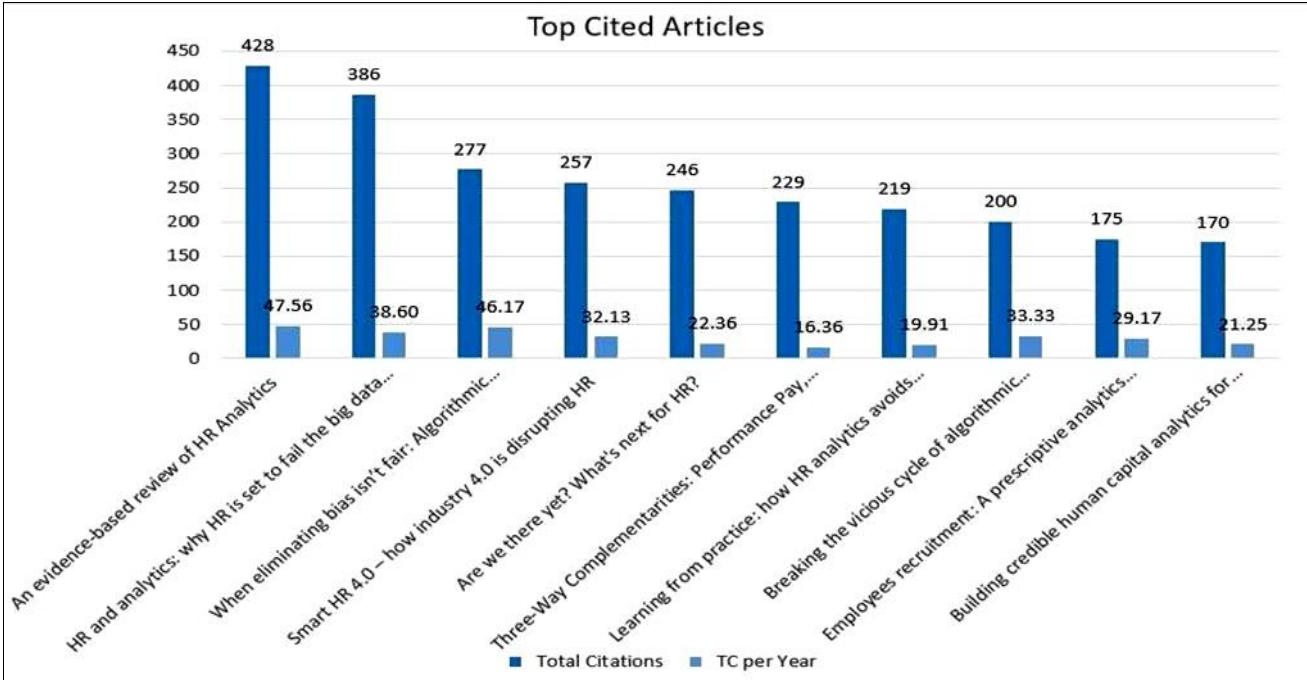
Source: Biblioshiny

Fig 3: Annual Scientific Publication Trends

Top Cited Articles

Citation analysis reveals the foundational works that have shaped scholarly discourse in HR analytics. The top ten globally cited HR analytics papers are shown in the bar graph along with their total citations and total citations annually. With 428 citations, the most cited article, "An Evidence-Based Review of HR Analytics," from 2017, is regarded as a foundational piece of work in the area. The 2016 paper "HR and Analytics: Why HR is Set to Fail the Big Data Challenge" provides a critical perspective on HR Departments' Readiness to Embrace Analytical

transformation and has 386 citations. Other highly influential publications include the conception of algorithmic bias ("When Eliminating Bias Isn't Fair", 2020), the ethical implications of predictive technologies ("The Promise and Peril of Algorithms in HRM", 2019), and the conceptual foundations of HR Analytics ("HR Analytics: A Critical Review", 2018). Collectively, these publications contribute to the theoretical underpinnings and practical advancement of the field. Figure 4 represents the top cited articles.



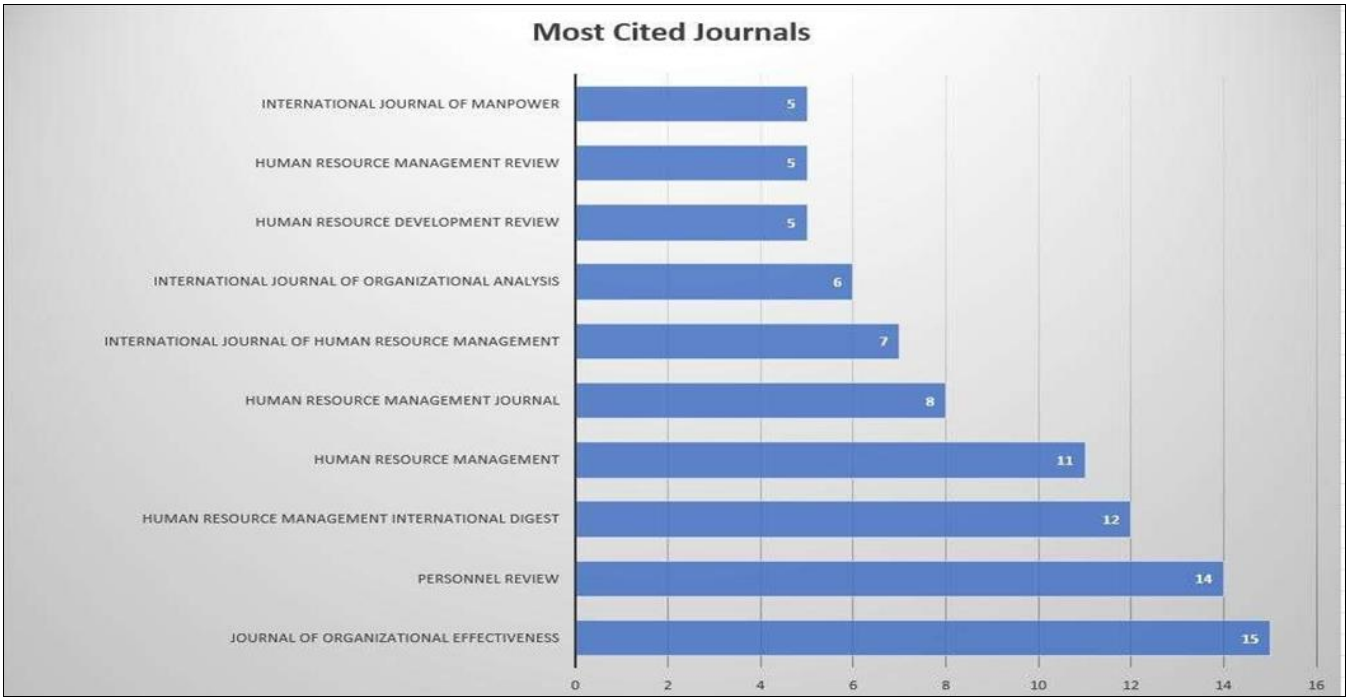
Source: Biblioshiny

Fig 4: Top Cited Articles

Top Ranked Journals

Figure 5 illustrates the top ranked journals. HR analytics research is published in a wide range of peer-reviewed journals. The graph represents the top 10 journal contributing in the domain of HR Analytics. It is evident that 266 articles (after applying filters) have been published in 134 journals. These journals serve as the intellectual

centers for HR Analytics research, covering everything from algorithmic decision-making ethics to analytics applications in talent and performance management. The existence of interdisciplinary publications further demonstrates how HR Analytics is cross- functional, connecting data science, organizational behavior, and human capital strategy.



Source: Biblioshiny

Fig 5: Top Ranked journals

Table 3: Top Ranked Journals

Sources (Journals)	Articles
Journal of Organizational Effectiveness	15
Personnel Review	14
Human Resource Management International Digest	12
Human Resource Management	11
Human Resource Management Journal	8
International Journal of Human Resource Management	7
International journal of Organizational Analysis	6
Human Resource Development Review	5
Human Resource Management Review	5
International Journal of Manpower	5

Source: Biblioshiny

This part answers the RQ2 relating to the top ranked journals. Table 3 represents the top 10 journals relating to the Human Resource Analytics. Journal of Organizational Effectiveness is the most famous journal with a total of 15 articles all over followed by Personnel Review with 14 published articles. On 3rd remains Human Resource Management International Digest with 12 articles published. There are other journals in line as well representing the majority of the publications with in them

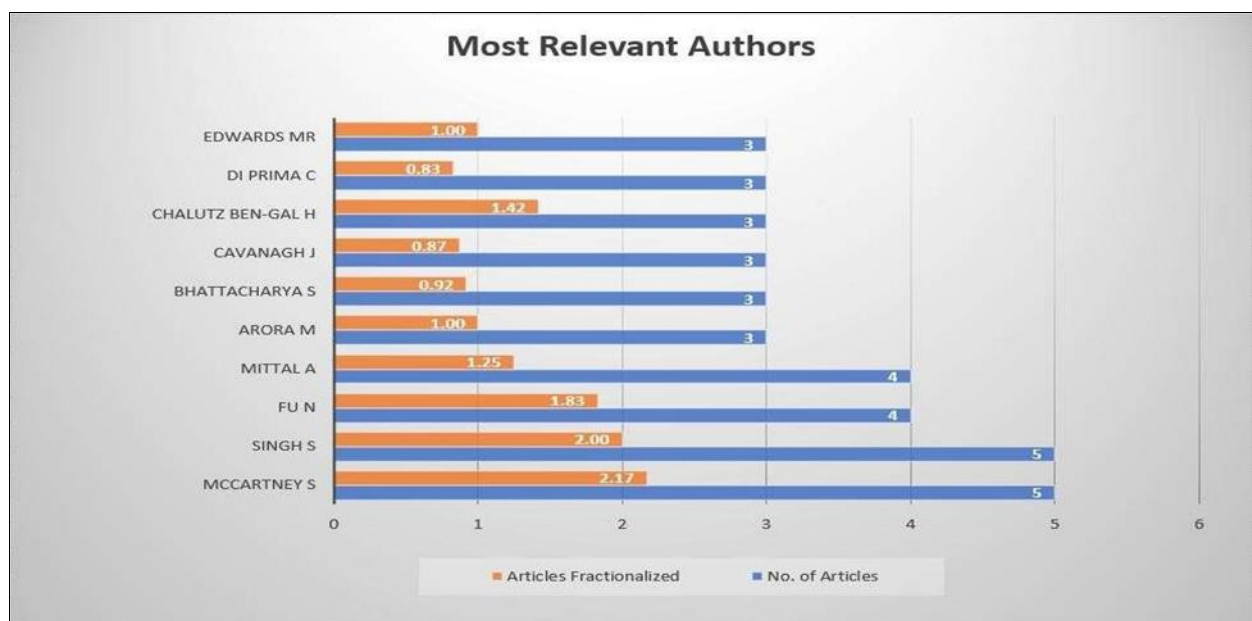
Top Contributing Authors

While answering the RQ3, the author productivity analysis identifies the writers who have had the greatest influence on the HR Analytics literature. Of the 266 papers that were examined, McCartney S. and Singh S. were the most prolific authors having a total of 5 articles with 2.17 and 2.00 articles fractionalization point. Behind them are Fu N. and Mittal A having 4 articles each and 1.25 and 1.00 articles fractionalized. Their leadership and continued

involvement in advancing theoretical and empirical perspectives in the field are demonstrated by their frequent appearances in esteemed HR and management journals. Their work often looks at how workforce dynamics are impacted by the digital revolution, how analytics can be used to strategic

Table 4: Top Contributing Authors and Articles Fractionalized

Authors	Articles	Articles Fractionalized
Mccartney S	5	2.17
Singh S	5	2.00
FU N	4	1.83
Mittal A	4	1.25
Arora M	3	1.00
Bhattacharya S	3	0.92
Cavanagh J	3	0.87
Chalutz Ben-Gal H	3	1.42
Di Prima C	3	0.83
Edwards MR	3	1.00



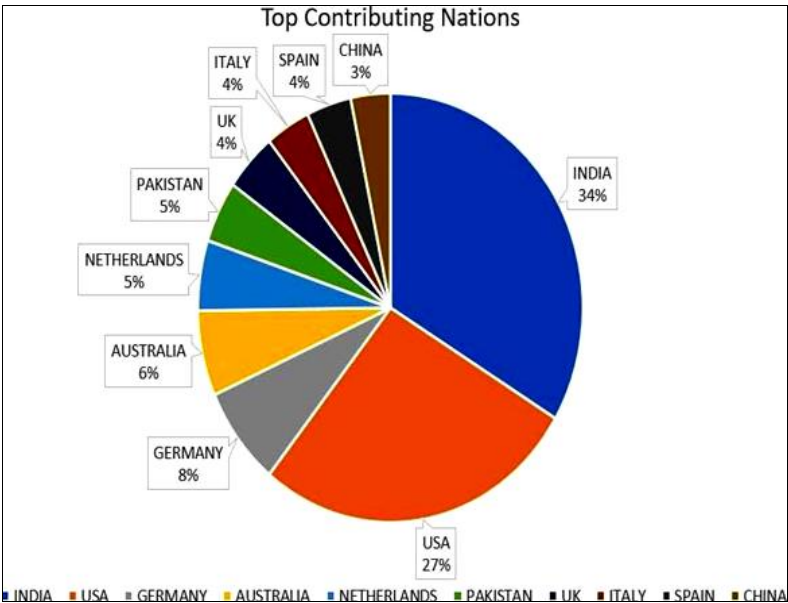
Source: Biblioshiny

Fig 6: Top Contributing Authors

Top Contributing Nations

It is evident that the concept of HR Analytics is spreading very rapidly over the world. In answer to the RQ3, the global distribution of the research demonstrates that there is a wide range of interest in HR analytics, with both developed and developing economies contributing significantly. Strong academic environments, easy access to

data infrastructure, and growing industry-academic collaborations are the reasons behind India's and the United States' prominence. India is the top contributor with 152 papers followed by U.S.A. 123 papers. Furthermore, the diversity of contributing countries enriches the literature by offering a range of contextual lenses, from Western strategic HRM frameworks to developing market challenges



Source: Biblioshiny

Fig 7: Top Contributing Nations

Table 5: Top Contributing Nations

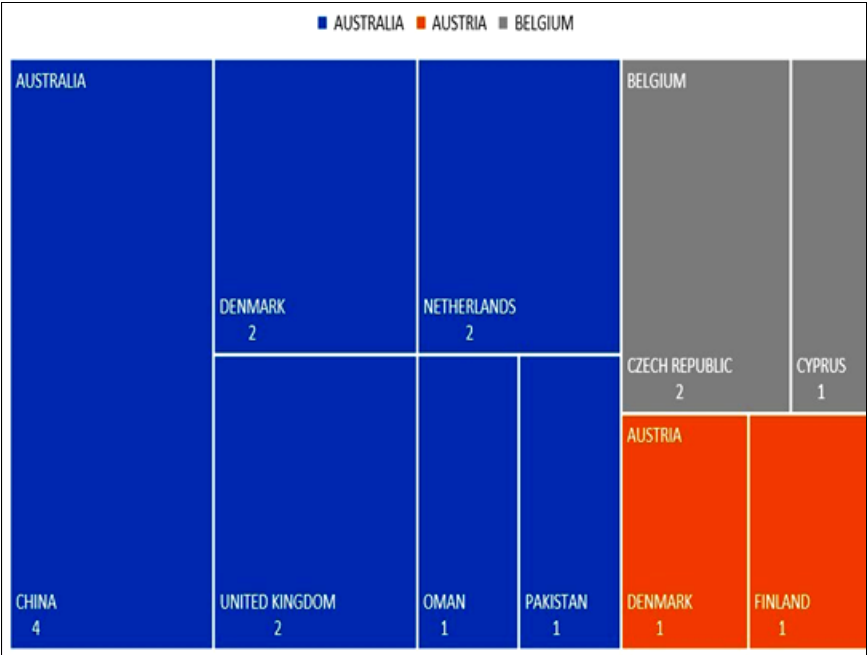
Nation	Frequency
India	152
USA	123
Germany	34
Australia	29
Netherlands	24
Pakistan	21
UK	20
Italy	17
Spain	17
China	15

Source: Biblioshiny

Countries' Collaboration World Map

Through the mapping of co-authorship between nations, the countries' collaboration world map demonstrates the global

research connections within the field. Each connection denotes a joint publication, and the frequency values show how strong these partnerships are. The analysis demonstrates how some nations serve as international centers, forming solid alliances with several other countries. As seen, Australia actively cooperates with China, Denmark, the Netherlands, and Oman in the dataset. These trends show cross-continental collaborations, which indicate the growing globalization of the research field, as well as regional ties, which are frequently fueled by geographic proximity. Increased collaboration rates frequently indicate established institutional networks, academic exchange programs, or common research priorities. The map highlights a core- periphery structure overall, with emerging countries steadily gaining ground within the global network while leading nations control global research collaboration.



Source: Biblioshiny

Fig 8: Countries' Collaboration World Map

Table 6: Represents the top 10 Collaborating Countries

Countries Collaboration World Map		
from	to	Frequency
Australia	China	4
Australia	Denmark	2
Australia	Netherlands	2
Australia	Oman	1
Australia	Pakistan	1
Australia	U.K.	2
Austria	Denmark	1
Austria	Finland	1
Belgium	Cyprus	1
Belgium	Czech republic	2

Keyword Analysis – Keyword Co-occurrence Network Analysis

The HR Analytics research's thematic structure was mapped using a keyword co-occurrence analysis (Van Eck & Waltman, 2010) ^[62]. Six main clusters that represent the field's theoretical underpinnings and developing directions were identified through an analysis of author keywords for frequency and co-occurrence.

1. **Green Cluster:** Core Analytical Concepts This cluster, which focuses on HR analytics, connects concepts like data analytics, workforce analytics, and human capital analytics. It encompasses the field's methodological foundation, which includes data infrastructure, metrics, and evidence-based HR decision-making (Marler & Boudreau, 2017; Angrave et al., 2016) ^[37, 4].
2. **Blue Cluster:** Aspects of People and Performance This cluster, which is headed by People Analytics, covers performance, engagement, ethics, and algorithms. It reflects research that links algorithmic HR practices'

fairness and analytics to employee outcomes (Tursunbayeva et al., 2018; Levenson, 2018) [60, 32].

3. **Red Cluster:** Methodologies Focused on Decisions As a tool for evidence-based and data-driven decision-making, this group emphasizes HR analytics. Systematic review, data strategy, and organizational effectiveness are common terms that reflect increasing methodological sophistication.
4. **Yellow Cluster:** Strategic and Human Capital Themes Positioning HR analytics within strategic HRM and broader organizational change initiatives, this cluster encompasses innovation, leadership, change management, and digital transformation (Marler & Boudreau, 2017; Minbaeva, 2012) ^[37, 39].
5. **Purple Cluster:** Predictive Retention and Modeling In workforce management, terms like prediction, machine learning, turnover, and retention signify the shift from descriptive reporting to predictive modeling (Isson & Harriott, 2016; Levenson, 2011) ^[28, 31].
6. **Orange Cluster:** HR Competencies and Technology This cluster, which includes digital competencies, e-HRM, and HRIS, focuses on developing capabilities and being technologically ready for the adoption of analytics (Bondarouk & Ruël, 2009; Margherita, 2022) ^[8, 36].

The most important nodes are "HR Analytics," "People Analytics," and "Human Resource Management," highlighting the interdisciplinary nature of the field that connects organizational studies, data science, and HRM. Promising directions for further research are indicated by emerging keywords like design thinking, explainable AI, and employee well-being (Tursunbayeva et al., 2018) ^[60].

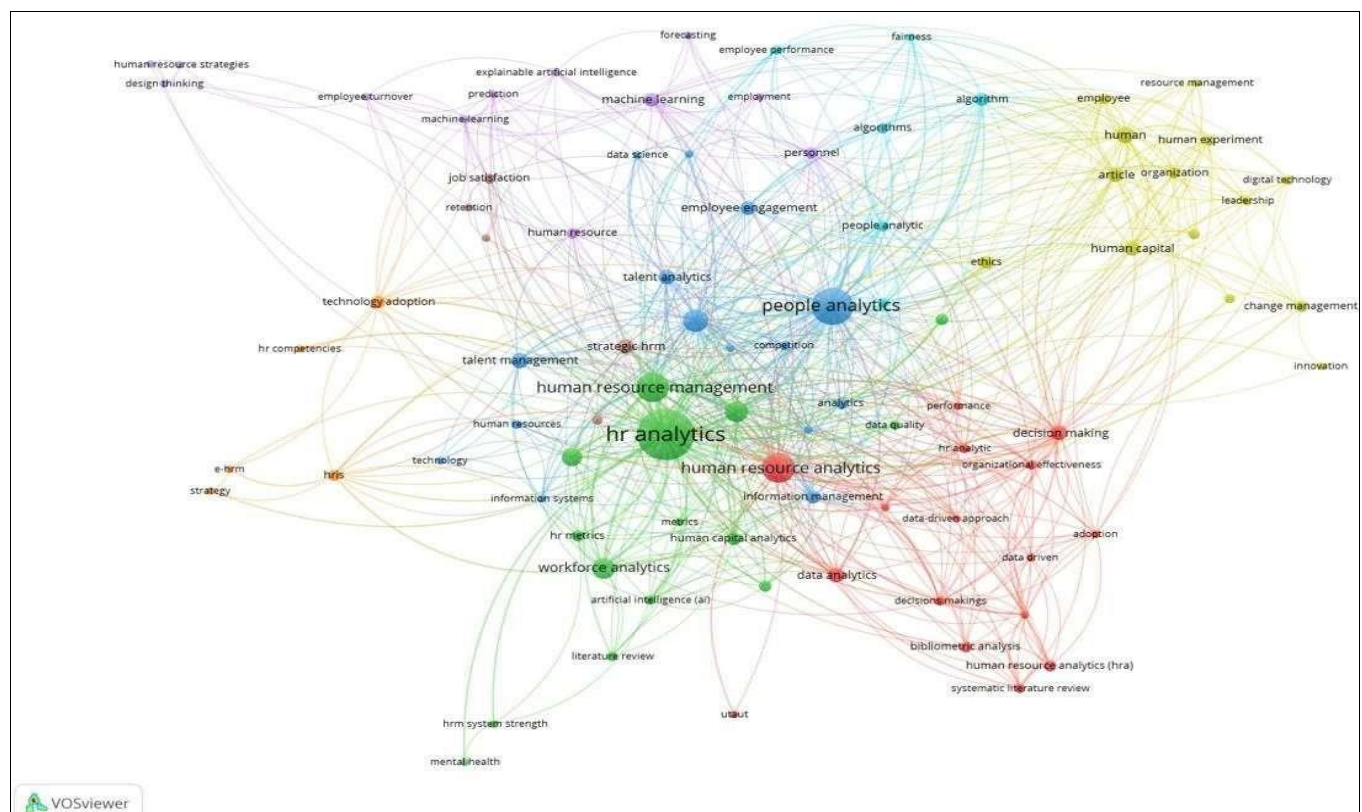


Fig 9: Keyword Co-occurrence Network Analysis

Systematic literature Review

Using the 5W1H framework, a systematic literature review is carried out. Answers to the Who, What, When, Where, Why, and How questions are part of the 5W1H Framework. This method's main goal is to gather relevant information and qualify any issue by taking into account all relevant factors. At the definition stage, it is helpful to ascertain the problem's extent and distinguish what is and is not a part of it. Using the framework, this section summarizes the results of 82 A and A* selected studies from the total of 266 papers. The framework offers a methodical summary of the thematic and intellectual trajectories found in the literature on HR analytics.

Who – Stakeholders in HR Analytics Research

There are 4 predominant key stakeholders' categories.

HR professionals: The main players advancing the use of HR analytics are HR managers and business partners. To convert data into workable strategies, they frequently work with data specialists to interpret data insights and incorporate analytical results into HR functions (Wirges et al., 2023) [68].

- **Senior executives and line managers:** They use analytics to guide strategic workforce planning, performance management, and hiring practices. They are decision consumers (Wiblen et al., 2021) [67].
- **The employees:** Employees supply data on performance, engagement, and turnover, making them the main subjects of HR analytics. Additionally, research looks at how analytics affects well-being, satisfaction, and inclusivity (Fernandez & Gallardo-Gallardo, 2021) [22].
- **IT and Analytics Teams:** Data scientists, IT specialists, and consultants help with the technical integration of analytics systems, especially when it comes to the use of AI and machine learning in HR platforms (Margherita, 2022) [36].

Together, these stakeholders form an interconnected ecosystem that generates, processes, and applies data to enable evidence-based human resource management

What – Thematic Foci of HR Analytics

- **Research Operational Efficiency:** Research indicates that organizational culture, technology infrastructure, data literacy, and leadership support are important factors that facilitate the adoption of HR analytics. Integration issues are especially noticeable in SMEs and emerging economies (Yadav & Lenka, 2020) [71].
- **Strategic Alignment:** By connecting human capital initiatives to firm-level outcomes like productivity, profitability, and competitiveness, HR analytics are strengthening the connection between business strategy and HR (Thakur et al., 2024) [58].
- **Talent management:** Analytics facilitates workforce planning, talent acquisition, and attrition forecasting, allowing for data-driven choices in hiring, promotion, and training (Alam et al., 2025) [3].
- **Advancement in Technology:** According to recent studies, the use of AI, machine learning, and predictive modeling has made it possible to move from descriptive to prescriptive HR analytics (Zamfir et al., 2022) [23].
- **Employee Outcomes:** New research highlights the

importance of analytics in promoting resilience and work- life balance by promoting inclusion, engagement, and well-being (Fernandez & Gallardo-Gallardo, 2021) [22].

When – Temporal Trends in HR Analytics Literature

A significant rise in scholarly interest after 2018 is indicated by the temporal distribution of the 82 studies. Although the initial research was limited and primarily conceptual, there has been a noticeable increase since 2020.

The keyword and publication trends indicate a clear evolution in the research focus:

- **Pre-2015:** Conceptualization and definitions of HR Analytics
- **2015–2019:** Integration into HR operations and performance management
- **2020 onwards:** Strategic application during crises (e.g., COVID-19), use of advanced analytics, and alignment with digital transformation goals.

Table 7: Temporal Trends in HR Analytics Research

Year	Studies Published
2016-2019	14
2020	8
2021	5
2022	12
2023	9
2024	26
2025	8

Source: Author’s Compilation

Where – Application Context

- **Corporate and Organizational Settings:** The majority of research focuses on business settings where strategic decision-making is aided by data-driven HR practices. These settings often support analytics-driven transformation through strong data infrastructures, HR automation tools, and leadership dedication.
- **Indian Context:** HR analytics adoption is expanding quickly in India, especially in the IT industry, where analytics improve workforce planning, talent acquisition, and retention. Though issues like poor data governance and reluctance to use analytics persist, the Indian context provides a rich research environment because of its technological readiness and economical HR procedures.
- **IT and Tech-Driven Sectors:** HR analytics is a logical fit for tech companies, which are distinguished by their extensive datasets and digital maturity. Research focuses on the use of sophisticated analytical tools and dashboards for skills management, employee engagement, and predictive workforce planning.
- **Public Sector Institutions:** Although there is little research on the government, healthcare, and educational sectors, it shows that analytics can be used to increase accountability, efficiency, and transparency. But implementation is frequently hampered by financial limitations and bureaucratic inertia.
- **Cross-National Studies:** Although comparative studies are still rare, they highlight the ways in which institutional frameworks, digital infrastructure, and cultural elements affect the adoption of analytics. Developed economies are more prepared and have more skilled workers than emerging ones.

Despite considerable variation in maturity and adoption levels, HR analytics generally shows broad applicability across a variety of institutional, cultural, and economic contexts.

Why – Research Objectives and Intentions

According to the reviewed literature, research on HR analytics has emerged as both a response to technological innovation and a strategic necessity for modern businesses. The core motivations guiding scholarly research into HR analytics can be categorized into five interrelated thematic purposes:

- **Strategic Alignment with Business Goals:** A number of studies highlight HR analytics as a strategic facilitator that helps match business objectives with HR practices. Analytics facilitates decision-making and supports programs like performance improvement, retention, and diversity management by providing real-time insights into workforce planning, talent allocation, and leadership development (Thakur et al., 2024; Minbaeva, 2021; Falletta & Combs, 2021) ^[58, 39, 19]. It makes it possible to switch from descriptive reporting to goal-oriented, prescriptive HR solutions.
- **HR Operations Optimization:** By increasing productivity and return on investment, analytics is frequently used to enhance key HR procedures, including hiring, training, appraisal, compensation, and retention (Fernandez & Gallardo-Gallardo, 2021; Alam et al., 2025) ^[22, 3]. Predictive models support ongoing process improvement by predicting attrition, identifying high-potential personnel, and assessing the efficacy of training (Wiblen et al., 2021) ^[67].
- **Accountability and Transparency:** Research shows that HR analytics can help HR become a more legitimate strategic, data-driven function. Analytics helps with compliance, fairness, and making moral choices. It also encourages openness in areas like pay equity and workforce diversity.
- **Theoretical and Conceptual Advancements:** New research has expanded our theoretical knowledge by creating capability maturity models and adoption frameworks, especially in developing economies. These models explain what makes HR analytics adoption easier or harder and how analytics adds value to an organization (Yadav & Lenka, 2020; Sharma et al., 2017) ^[71, 54].
- **Responding to Societal and Contextual Challenges:** HR analytics is becoming more and more important for dealing with problems in society and the workplace, such as remote work, digital transformation, and diversity, equity, and inclusion (DEI). It helps keep workers healthy and adaptable during crises like COVID-19 by using data to keep an eye on engagement, collaboration, and employee health (Fernandez & Gallardo-Gallardo, 2021) ^[22].

How – Methodological Approaches to HR Analytics Research

In the studies, the methodological trends fall into six major categories:

- **Quantitative Approach:** In order to test the relationships between analytics capability, productivity, and performance and to statistically validate the strategic impact of HR analytics, the majority of HR

analytics research uses quantitative techniques such as surveys, regression analysis, SEM, and predictive modeling.

- **Qualitative Research:** Qualitative designs, such as ethnography, case studies, and interviews, investigate contextual elements like governance, culture, and leadership attitudes. The intricacies of adoption and implementation is revealed by thematic and grounded analyses.
- **Systematic Literature Reviews (SLRs):** PRISMA-guided SLRs identify research streams pertaining to adoption, strategic value, technological readiness, and ethics by synthesizing previous studies to ensure rigor and transparency (Fernandez & Gallardo-Gallardo, 2021) ^[22].
- **Bibliometrics Analysis:** The field's intellectual structure is mapped by bibliometric analyses, which also track collaboration networks, influential authors, and thematic evolution to identify new areas of study (Margherita, 2022) ^[36].
- **Mixed-methods studies:** Combining both quantitative and qualitative techniques to connect statistical generalization with contextual depth, while conceptual works offer frameworks on HR analytics maturity and adoption models. When combined, these approaches deepen our understanding of HR analytics as an organizational and technical phenomenon.

Discussion and directions for future research

The integration of Systematic Literature Review (SLR) and Bibliometric Analysis offers a thorough, multifaceted understanding of the development, organization, and subject matter of HR Analytics (HRA) research. The SLR provides interpretative depth, whereas bibliometrics provides a quantitative mapping of the field. When combined, they improve theoretical comprehension and practical applicability. Using Biblioshiny (R Package) and VOSviewer, the bibliometric analysis measured publication trends and identified top authors, organizations, nations, and central themes. Among the topics it covered were: Who makes the most contributions to HRA research? Which topics are most popular? In what ways has the field changed over the years? In addition to highlighting new subjects like diversity, ethics, and well-being, keyword co-occurrence and collaboration networks identified six main research clusters.

Following the 5W1H framework, the systematic review thoroughly examined 82 chosen studies. The strategic importance of HRA was reaffirmed by the convergence of findings from both approaches, with terms like decision-making, performance, and people analytics predominating in all analyses. Similarly, SLR findings highlighting the importance of HR analytics in business alignment were supported by bibliometric clusters like leadership and strategic HRM. From an operational reporting tool to a strategic decision-making partner, HRA has changed over the last ten years. Prior to 2015, research efforts concentrated on defining HRA and distinguishing it from conventional HR metrics (Margherita, 2022) ^[36]. Research focused on turnover prediction, performance management, and predictive analytics between 2016 and 2019 (Falletta & Combs, 2021) ^[19]. With a focus on inclusion, remote work, emotional analytics, and employee well-being, the field has conceptually expanded since 2020 (Fernandez & Gallardo-

Gallardo, 2021) ^[22]. This change was further confirmed by keyword evolution, which went from "What is HR Analytics?" to "How can HR analytics be strategically applied?" and from "How can HR improve efficiency?" "How can HR promote innovation, inclusivity, and agility?" Despite several studies relating to HR Analytics, new research is necessary in some areas. Answering to the RQ5, future researchers have the opportunity to address several research gaps.

- 1. Lack of Financial Performance Integration:** While many studies look at how HR analytics impact HR operations and decision-making, few find a clear link between it and business-level financial outcomes like return on assets (ROA) or return on equity (ROE) (Minbaeva, 2021) ^[39].
- 2. Geographic and Industry Bias:** The majority of empirical studies concentrate on the services and technology industries (Margherita, 2022; Alam et al., 2025) ^[36, 3]. This restricts our ability to understand the effectiveness of HR analytics in both emerging markets and more established industries like manufacturing, education, and public administration.
- 3. Methodological Fragmentation:** It is clear that qualitative, contextually rich investigations differ from quantitative, in-depth data analysis. Insufficient research employs mixed-methods designs, which are essential for fully understanding the technical and human aspects of HR analytics (Alam et al., 2025; Sharma et al., 2017) ^[3, 54].
- 4. Lack of Longitudinal Research:** Most studies are cross-sectional and measure immediate outcomes. We still don't fully understand HRA's long-term effects, such as how it affects workforce resilience, innovation, and culture. (Minbaeva 2021) ^[39].

Conclusion

Through a combined Bibliometric Analysis and Systematic Literature Review (SLR), organized according to the 5W1H model, this paper investigated the conceptual and thematic landscape of Human Resource Analytics (HRA). A comprehensive picture of the field's development, major figures, and new directions was offered by the integrated approach. The growing role of HRA in strategic HRM was highlighted by the bibliometric results, which showed a spike in scholarly activity after 2015. Although research is still primarily focused on particular areas and industries, significant authors, journals, and nations were identified. Recurring themes like accountability, operational effectiveness, strategic alignment, and theoretical advancement were brought to light by the SLR findings. The findings taken together demonstrate that HRA has changed from a technical reporting role to a strategic capability that promotes long-term organizational value and data-driven decision-making. The study synthesized 82 academic works and identified three main research gaps: the lack of thorough ethical frameworks, the lack of empirical support for the financial impact of HRA (such as ROA and ROE), and the underrepresentation of emerging markets and non-tech sectors. This study offers macro-level trends and micro-level thematic insights by combining quantitative bibliometric mapping with qualitative synthesis, improving methodological rigor and practical relevance. The results lay the groundwork for further investigation, promoting sector-specific, theory-driven research and models of ethical

governance. In practice, companies can compare their HRA maturity and match analytics procedures to international standards and strategic goals. In the end, this research reaffirms that HR analytics is a transformative tool that connects workforce strategy and business performance, not just a technological advancement. It advances HRM scholarship, helps policymakers, and prepares practitioners to use analytics to build performance-driven, ethical organizations.

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