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# Bibliometric Analysis of Artificial Intelligence Applications in Human Resource Management (2010–2025): Mapping Global Research Trends and Organizational Implications

## Analyse bibliométrique de l'intégration de l'Intelligence Artificielle dans la Gestion des Ressources Humaines (2010-2025) : Cartographie des tendances mondiales de la recherche et des implications organisationnelles.

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**Abstract**

**Purpose**: In this study, we seek to systematically chart the intellectual structure of AI applications in HRM based on a bibliometric approach from 2010 to 2025 as an item. This study implies a positivism epistemological stance, identifying publication trends within a positivist perspective, using structured data and statistical tools to reveal generalized patterns within the academic literature. It analyses the development of the literature, top contributors, thematic networks and collaboration ties, and concludes with consideration of the findings for the field of industrial organizations. Finally, the reasoning for this study goes deductive using a general database analyzed to drive findings that are interpreted to draw specific conclusions about thematic evolution in this field.

**Design/methodology/approach:** A total of 354 peer-reviewed articles were systematically extracted from the Scopus database using a targeted search query. combining AI and HRM-related terms. This bibliometric dataset constitutes the empirical sample of the study. The extraction process was governed by inclusion criteria such as language (English), document type (articles only), and relevance to HRM-AI topics. The analysis was conducted using Bibliometrix (R package) for performance indicators as a quantitative analysis and VOSviewer for co-occurrence and co-authorship visualizations and thematic mapping. The study focuses on five research questions addressing productivity trends, influential entities, thematic clusters, international collaboration, and research gaps. Explanatory variables of this study include publication year, country origin, document affiliation, author productivity and citation count.

**Findings:** The results show a sharp increase in publication volume post-2018, indicating increasing academic interest in the intersection between AI and HRM, with strong contributions from institutions with items in the USA, UK, and India. Six major thematic clusters were identified, spanning AI adoption in HRM, decision-making, systematic reviews, ethical considerations, and education-related topics. However, regional imbalances persist, particularly with the underrepresentation of African and MENA contexts. Additionally, the literature often overlooks function-specific HR practices and lacks multidisciplinary depth. This bibliometric mapping concludes that valuable insights for researchers to understand the evolving landscape of AI integration on HRM.

**Practical implications:** By linking findings to the domain of Industrial Organization, the study highlights how AI reshapes decision-making structures, reallocates managerial authority, and influences organizational power dynamics. These insights inform both academic discourse and HR policy design.

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**Originality/value:** This is one of the few papers that provides a longitudinal bibliometric mapping of AI-HRM research. It offers an organized agenda for future work to promote inclusiveness by geographic scope, discriminant-level detail, and disciplinary integration.

**Keywords:** Artificial Intelligence, Human Resource Management, Bibliometric Analysis, Industrial Organization, Co-word Mapping, Decision-Making Structures.

**Introduction**

The Fourth Industrial Revolution (also known as Industry 4.0) is transforming the shape and behavior of current businesses. The compounding of digital technologies, such as AI, Big Data, and IoT, are reshaping the conventional mode of doing business, posing both challenges and opportunities for organizations and labor markets (Shin, 2025). Among them, AI stands out as a key facilitator of efficiency and innovation within HRM, in uses such as algorithmic recruitment and predictive performance analysis tools (Yakubovich, 2019) and automatic ways of engaging the workforce or tailored training offers (Al-Ayed, 2025).

Human Resource Management (HRM), long considered an administrative adjunct, has moved to a pivotal place in strategy implementation. AI enables HR managers to use data to optimize workforce planning, monitoring employee sentiment and developing personalized career paths are some of the ways to aligning organizational objectives with individual development (Budhwar et al., 2023). But it is not without consequences. Given AI systems are doing the thinking that once was undertaken by human beings, it is not surprising to see concerns as to aspects of transparency, fairness, data privacy and employee autonomy bubble to the surface, all are concepts which find echoes in central IO themes, such as power asymmetries, coordination costs, and incentive provision. (Levy, 2015).

Although academic research on AI-based HRM is increasing at a fast pace, the literature is still dispersed among disciplines, geographies and thematic concerns. There has been no such exploration in this field that has systematically mapped its intellectual structure or provided a complete synthesis of its development. Bibliometric analysis can be a powerful quantitative tool to address this lacuna, as it allows researchers to analyze publication trends, map thematic clusters and investigate successful authors, institutions and collaboration networks (Zupic & Čater, 2015). Visualization software packages such as VOSviewer and Bibliometrix facilitate the identification of conceptual structure and temporal trends in a structured and reproducible way (Van Eck & Waltman, 2017).

This article has the objective to perform a bibliometric review about scientific publications on HRM and AI intersection in the period from 2010 to 2025, through the Scopus database. It

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speaks to the Industrial Organization literature by exploring the impact of AI on managerial decision-making, organizational design, or competitive dynamics in labor markets. The analysis contributes to understanding the new research frontiers and to laying the groundwork for future research on the role of AI strategically in human capital.

## 1. Research questions

To guide this bibliometric inquiry, the study addresses five key research questions.

- RQ1: What is the volume and temporal evolution of scientific production in AI-HRM research from 2010 to 2025?
- RQ2: Who are the most productive and influential authors, journals, and institutions?
- RQ3: What are the most explored themes and their intellectual structures (co-word analysis)?
- RQ4: What countries and institutions are leading collaboration networks?
- RQ5: What gaps can be identified for future research, particularly from an organizational perspective?

These questions are designed not only to map the scholarly landscape but also to uncover the underlying dynamics shaping the development and diffusion of AI in HRM practices.

The rationale for these questions is grounded in the need to understand how AI, as a general-purpose technology, reconfigures the mechanisms of resource allocation, labor coordination, and decision-making within firms—core concerns of Industrial Organization. By focusing on authorship patterns, institutional leadership, thematic clusters, and collaboration networks, we aim to capture both the structural and strategic contours of knowledge production. Moreover, these insights allow us to evaluate the extent to which academic research aligns with the organizational realities of AI adoption, including asymmetries in technological diffusion, concentration of innovation, and shifts in managerial authority.

From a practical standpoint, answering these questions will help identify which subdomains of HRM (e.g., recruitment, performance management, training) are receiving the most scholarly attention, and which remain underexplored. This is especially relevant for firms seeking to integrate AI-driven systems in ways that are not only efficient but also ethically and economically sustainable. In this sense, the research questions reflect an interdisciplinary ambition—merging bibliometric evidence with conceptual themes from Industrial Organization to inform both scholarly debates and managerial strategy in the era of intelligent HR systems

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## 2. Methodology

This study employs a quantitative bibliometric approach to systematically map the scholarly landscape surrounding Artificial Intelligence (AI) applications in Human Resource Management (HRM). Bibliometric methods provide a robust means of exploring patterns in academic literature, identifying influential publications, tracking thematic trends, and analyzing scientific collaboration networks (Zupic & Čater, 2015). To this end, two complementary tools were used: Bibliometrix (R-based analytical package) for quantitative performance analysis, and VOSviewer for the graphical visualization of bibliographic data (Van Eck & Waltman, 2017).

### 2.1. Data Collection

The data was sourced from the Scopus database, known for its comprehensive coverage of peer-reviewed literature in management, economics, and the social sciences (Harzing & Alakangas, 2016). The search was executed using the Boolean query:

> `TITLE-ABS-KEY("Artificial Intelligence") AND TITLE-ABS-KEY("Human Resource Management")`

The following filters were applied:

- Publication years: 2010 to 2025
- Document type: Articles only
- Language: English
- Subject areas: Business, Management and Accounting; Decision Sciences; Economics, Econometrics and Finance; Social Sciences

Following the filtering process, 354 papers were obtained. The data were exported in CSV format, which is compatible with Bibliometrix and provides metadata fields such as titles, authors, affiliations, abstracts, keywords, and citations.

### 2.2. Data Analysis

Using Bibliometrix, we computed descriptive indicators such as annual scientific output, author productivity, source impact, and institutional contribution. We then applied VOSviewer to visualize co-authorship networks, keyword co-occurrence, and thematic clusters. This dual-method approach enhances both the depth and clarity of the bibliometric interpretation.

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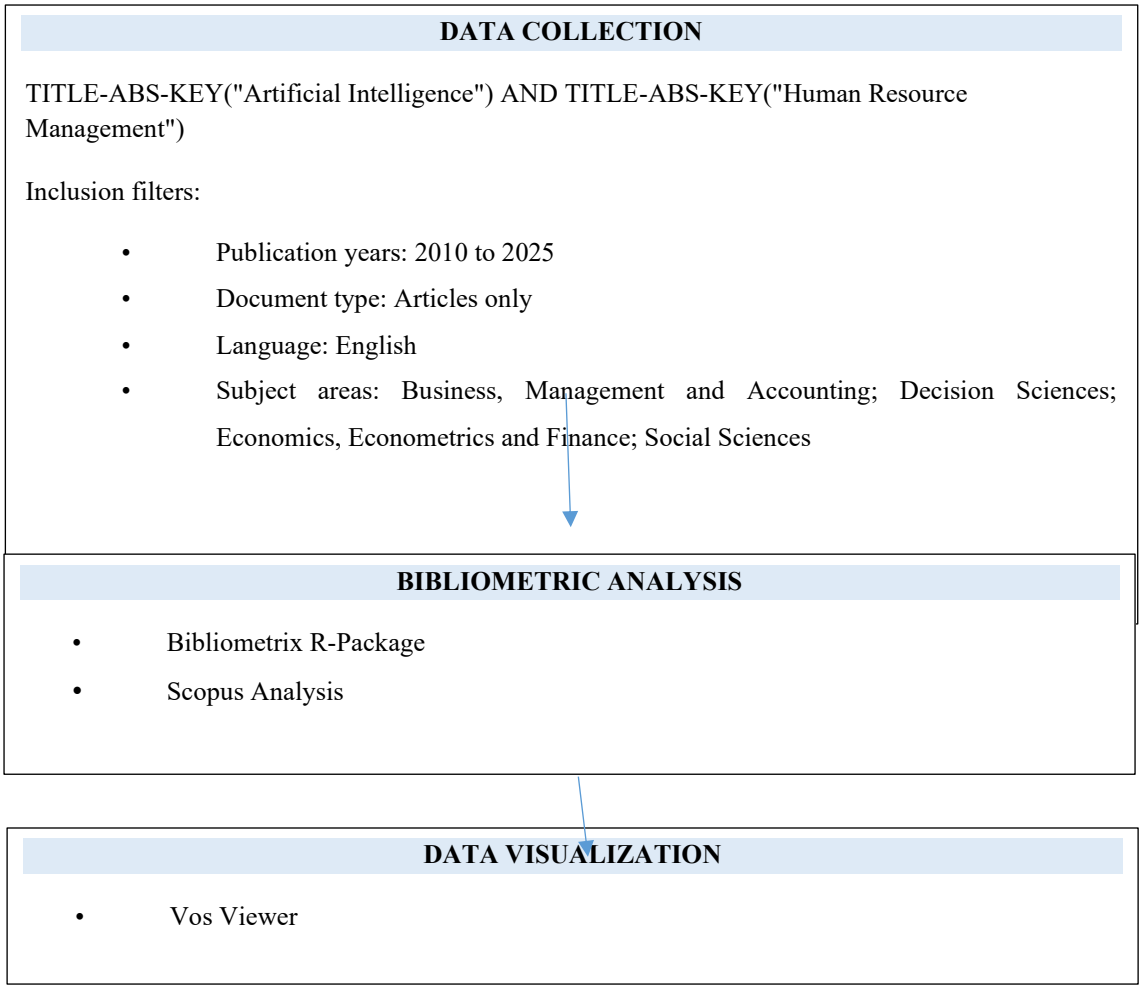
**Figure N°1 : -** Research Design Flowchart




Source: Elaborated by authors

This figure illustrates the three-step research methodology applied in the bibliometric analysis of AI applications in Human Resource Management (HRM). The process begins with data collection from the Scopus database, where a structured search query and a set of inclusion criteria (year range, document type, subject area, and language) are applied. In the second step, the exported CSV file is processed using the Bibliometrix R-package to compute bibliometric indicators such as author productivity, source impact, and citation trends. The final step involves data visualization using VOSviewer, allowing for the generation of co-authorship networks, keyword co-occurrence maps, and thematic clusters.

As shown in Figure 1, this methodological flow ensures both quantitative rigor and visual clarity in representing the structure and evolution of the literature. The use of Scopus provides high-quality, peer-reviewed academic data aligned with the study's disciplinary scope. Bibliometrix allows for statistical and performance-based insights, while VOSviewer offers a visual interpretation of intellectual and social structures within the research domain. This dual

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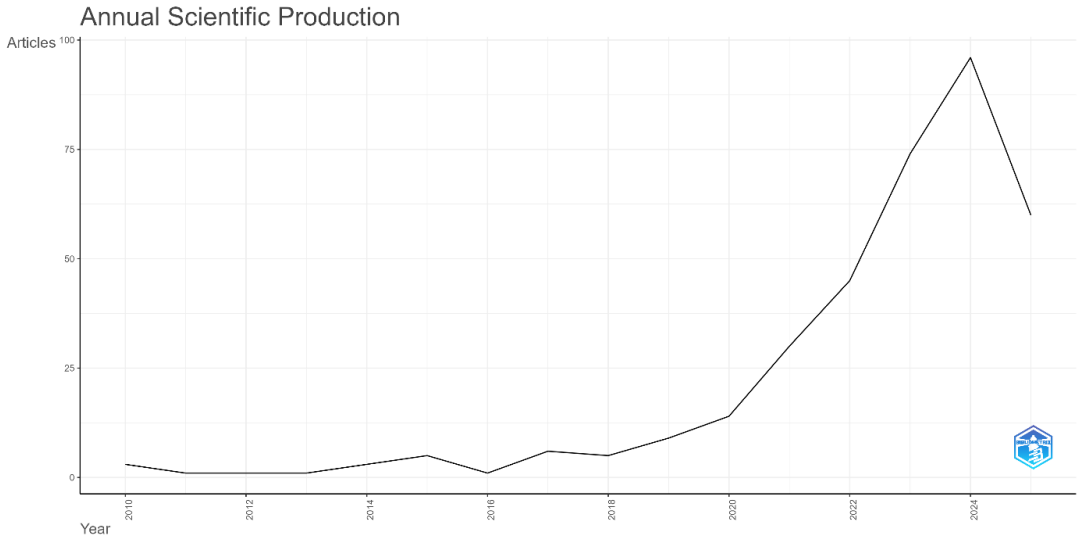
approach is particularly relevant to the field of Industrial Organization, as it reveals the concentration of knowledge production, collaboration dynamics between institutions, and strategic shifts in the discourse surrounding AI and HRM.

## 3. Results

### 3.1. Volume and Temporal Evolution of Scientific Production (RQ1)

Figure 2: Annual Scientific Production (Bibliometrix)




Source: Scopus database.

The scientific production in the area of Artificial Intelligence (AI) applications for Human Resource Management (HRM) has experienced a noticeable spike from 2018, according to the graphs “Annual Scientific Production” and “Documents by Year” obtained using through Bibliometrix and Scopus command, respectively. Along this period f(2010–2017) publishing was moderate and with some stability ( Figure 2). However, a significant rise in the quantity of scientific output can be seen from 2018 onwards, peaking in 2023, indicating that the increase in interest to utilize AI in HR practices is associated to the digital transformation pressures and the change in the dynamics of work post pandemic.

This exponential growth is in congruence with the continued harnessing of smarts systems in hiring, reporting and manpower analytics.

The intersection of AI and HRM evolved from a rare phenomenon to being a core theme in management and organizational studies. This growth also reflects wider industry trends of Industry 4.0 and the incorporation of big data with machine learning into organizational decisions. This emerging literature suggests a strategic reconfiguration of HRM as a data-oriented practice that is central to innovation, resilience, and sustainable organizational performance.

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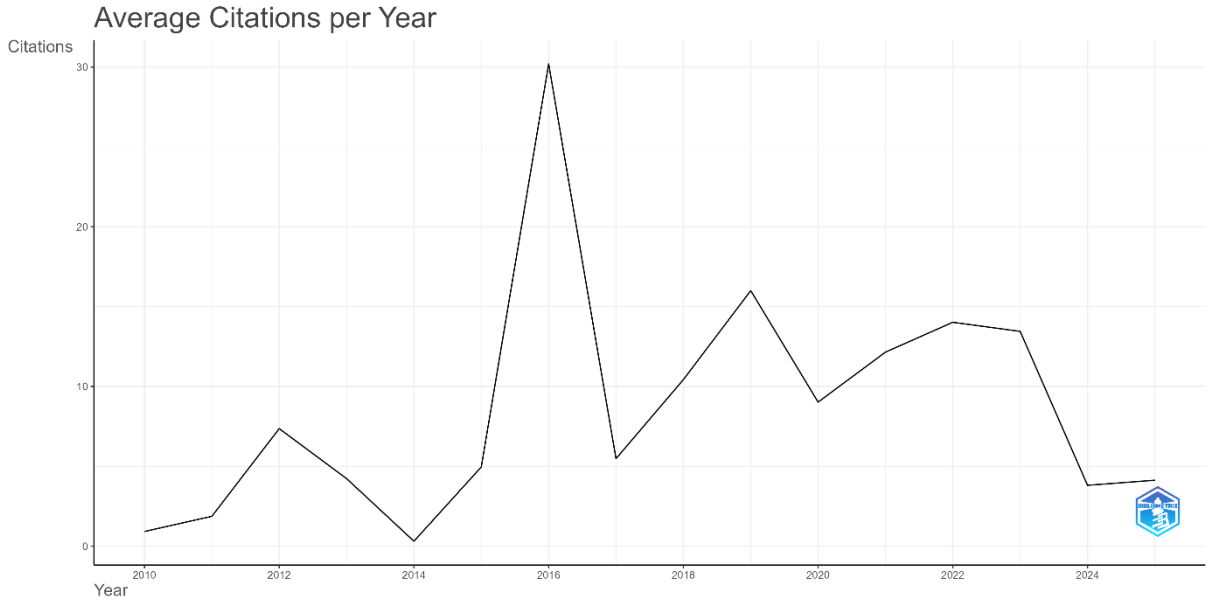
Figure 3: Average Citations per Year (Bibliometrix)




Source: Scopus database

In parallel with the rise in publication volume, the average citation count per year (Bibliometrix plot) provides insights into the scholarly impact of the research. The data reveal a spike in citations around 2016, likely driven by seminal contributions that catalyzed the field. Although citation averages fluctuate thereafter, a sustained level of academic engagement persists, highlighting the relevance of AI-HRM studies to both academic and professional communities. The initial high citation levels relative to fewer publications indicate that early research in this domain had significant influence. In contrast, the more recent years (2022–2024) show higher production but relatively lower average citations, a common trend due to the citation lag effect ( Figure 3). This temporal evolution suggests a maturing field with ongoing diversification of research themes and methodologies. The combination of quantitative output and qualitative impact underscores AI-HRM as a fertile domain, particularly within strategic management, organizational behavior, and industrial organization studies. These findings validate the need for continued bibliometric assessments to monitor how this knowledge evolves in response to technological advances and labor market shifts. Future research could further investigate the correlation between emerging technologies and their perceived organizational value to refine strategic HRM applications.

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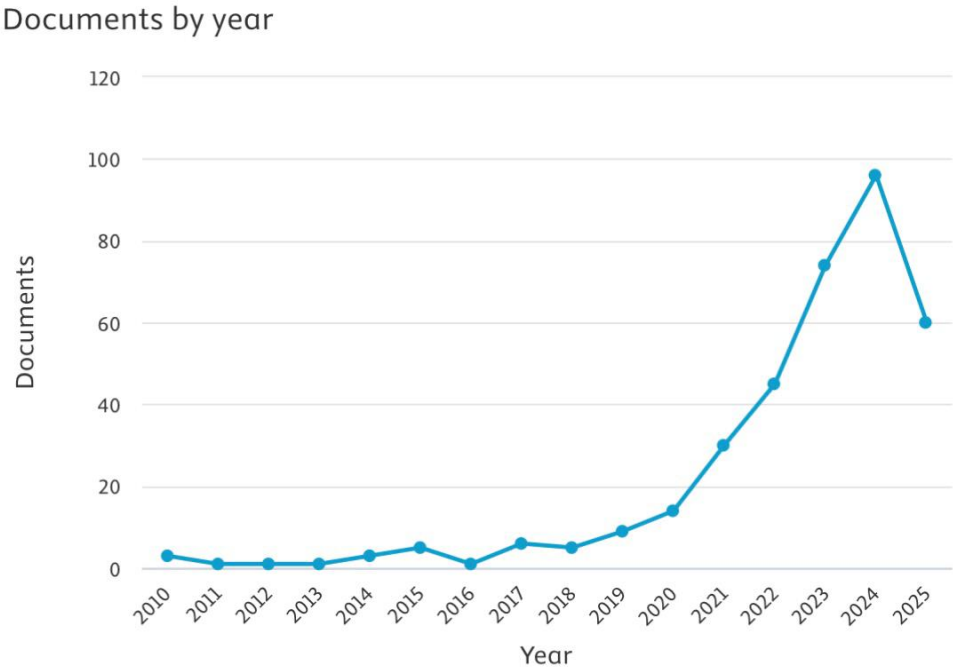
Figure 4: Documents by Year (Scopus)




Source: Scopus database

The "Documents by year" diagram in Scopus shows an increasing number of documents in Artificial Intelligence (AI) and HRM from 2010 to 2025. From 2010 to 2016 the number of publications regarding AI-HRM were very low and stable, which suggested that AI-HRM was an emerging, but not well-explored theme during these years ( Figure 4). We see a mild growth starting from 2017, a timing that coincides with the surge of AI tool usage in business operations and the rise of digital transformation in various sectors.

The most significant expansion is observed since 2020, with an acceleration in 2022 and a maximum in 2024. This spike was driven by post-COVID-19 digital acceleration where businesses had to transform HR systems to flexible remote work, digital onboarding, AI-driven recruitment, monitoring of employees, etc. The decline in 2025 is likely due to data incompleteness for that year.

Such a temporal development suggests that AI in HRM is no longer a niche interest but become widely recognized as a central management issue. And it reflects industry organization patterns that are redefining labor markets in the age of automation, datafication, and algorithmic decision-making—all hallmarks of the Fourth Industrial Revolution. These processes render the domain particularly pertinent to strategic, policy-based, and interdisciplinary research agendas.

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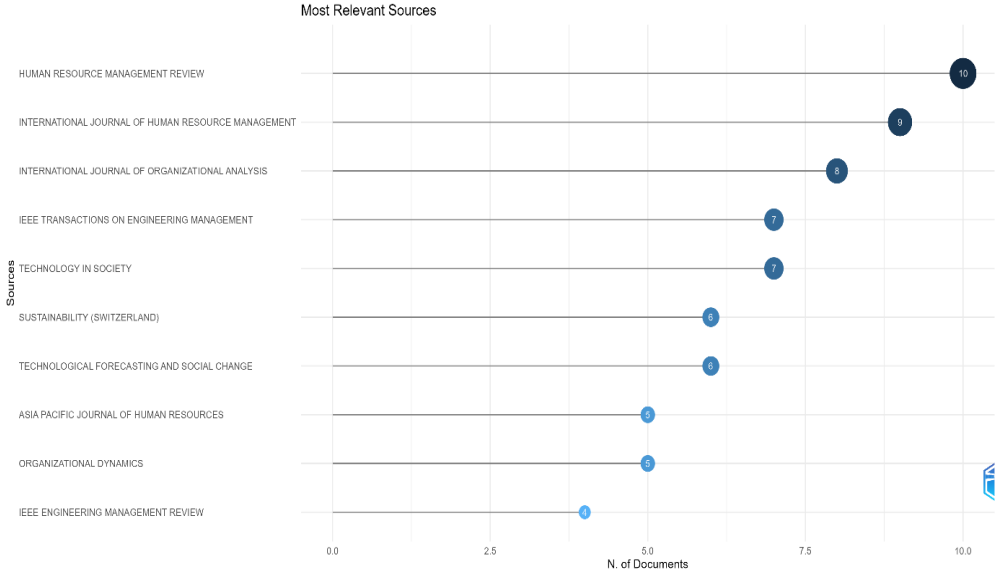
### 3.2 Most Productive and Influential Contributors (RQ2)

Figure 5: Most Relevant Sources (Bibliometrix)




Source: Scopus database

To address this question, we examined the most relevant sources contributing to the AI-HRM research domain. The bubble plot titled "Most Relevant Sources" shows the most relevant sources, of the top journals that publish documents (Web of Science) between 2010 and 2025, by volume ( Figure 5). The most contributed journal is the Human Resource Management Review (10 articles), followed by International Journal of Human Resource Management (9) and International Journal of Organizational Analysis (8). These elite journals serve as the foundational intellectual centers through which AI.HRM research is streamed out.

It is also significant that this plot also finds that when technology-oriented journals such as IEEE Transactions on Engineering Management and Technology in Society are taking into account, the academia is starting to be interdisciplinary. Journals with a focus on social impact, sustainability reporting and forecasting (e.g. Sustainability and Technological Forecasting and Social Change) are also evident, suggesting that the debate transcends a purely managerial and technical discourse into the realms of ethical, organizational and policy debate.

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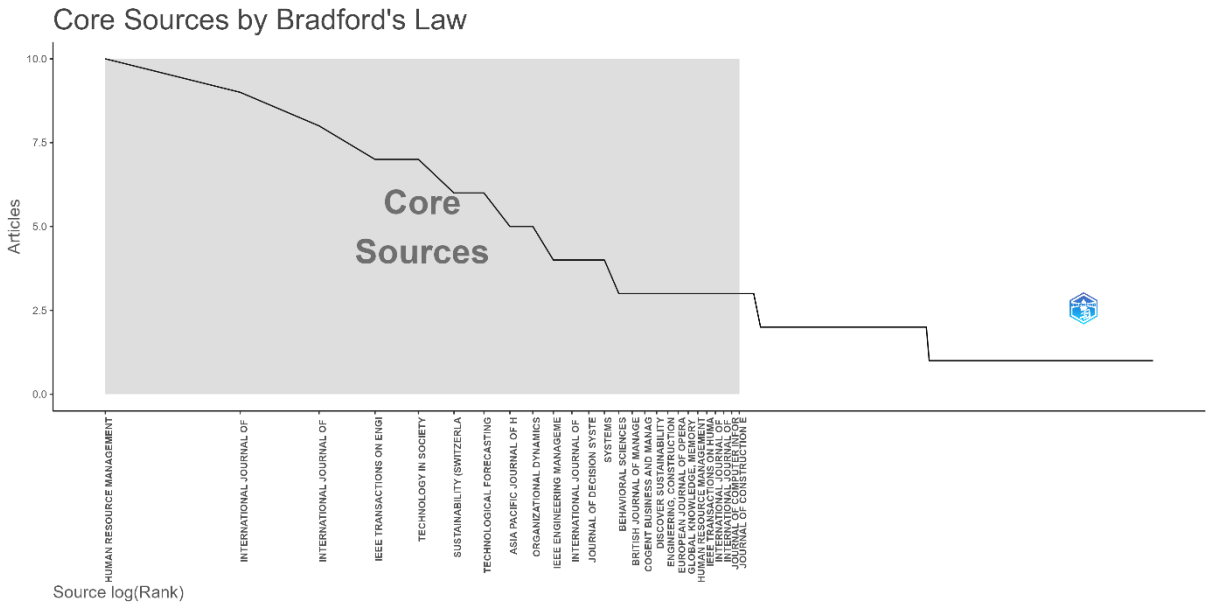
Figure 6 : Bradford's Law: Core Sources (Bibliometrix)




Source: Scopus database

To further deepen our understanding of the most influential publication venues in the AI-HRM research landscape, we applied Bradford's Law, which helps identify the "core" sources that produce the largest volume of literature on a specific topic. The plot indicates a small number of core journals in the discipline ( Figure 6) . These comprise Human Resource Management Review, International Journal of Human Resource Management, and International Journal of Organizational Analysis as the combined major contributors to the relevant literature.

As we move down the ranked journal list, we hit an abrupt drop in amount of output: Bradford's principle (a small number of journals contribute the vast majority of output whereas a long of "tail" of less productive journals contribute much less content) is evident. This pattern signals that influential work is pooled among few outlets, giving a clear signal to scholars aiming to publish in those places.

The shaded area of the graph denotes the range of core knowledge spread, which could assist researchers to choose relevant journals for their literature review, submission as well as for being updated by recent cutting edge contributions. The pattern also signals a relatively mature and clustered scholarly ecosystem around AI applications in HRM.

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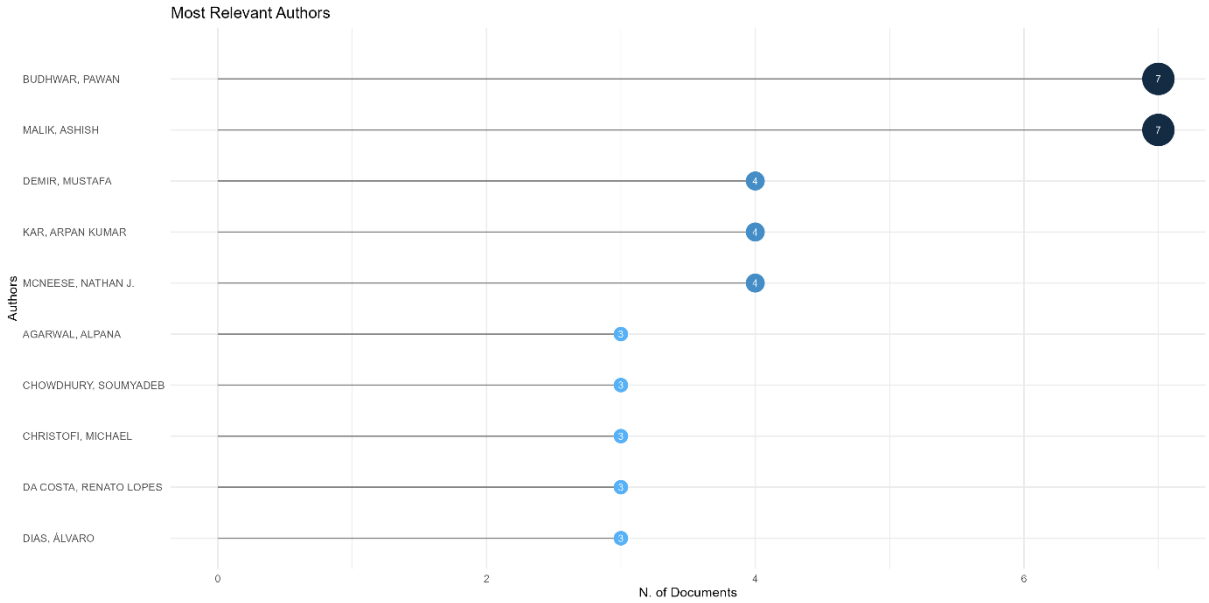
Figure 7: Most relevant Authors (Bibliometrix )




Source: Scopus database

The Bibliometrix analysis of the most relevant authors in AI-HRM research highlights a concentrated group of scholars driving the field. Notably, Pawan Budhwar and Ashish Malik emerge as the most productive contributors, each with seven publications. Their repeated presence in AI-HRM literature suggests sustained engagement and leadership in exploring the intersection between technological innovation and human resource practices ( Figure 7). Following closely are Mustafa Demir, Arpan Kumar Kar, and Nathan J. McNeese, each contributing four documents, indicating their active role in shaping ongoing discourse.

The authors identified span a diverse set of affiliations and likely represent collaborative and interdisciplinary efforts, reflecting the complex nature of integrating AI into HR systems. These researchers contribute across thematic areas such as decision-making, digital transformation, and ethical AI adoption in HRM. The distribution of author productivity suggests a field that, while still maturing, is supported by a stable base of recurring contributors who are laying foundational frameworks and driving new research agendas. This concentration of expertise also opens up opportunities for further collaboration and knowledge diffusion within the academic and professional HRM communities.

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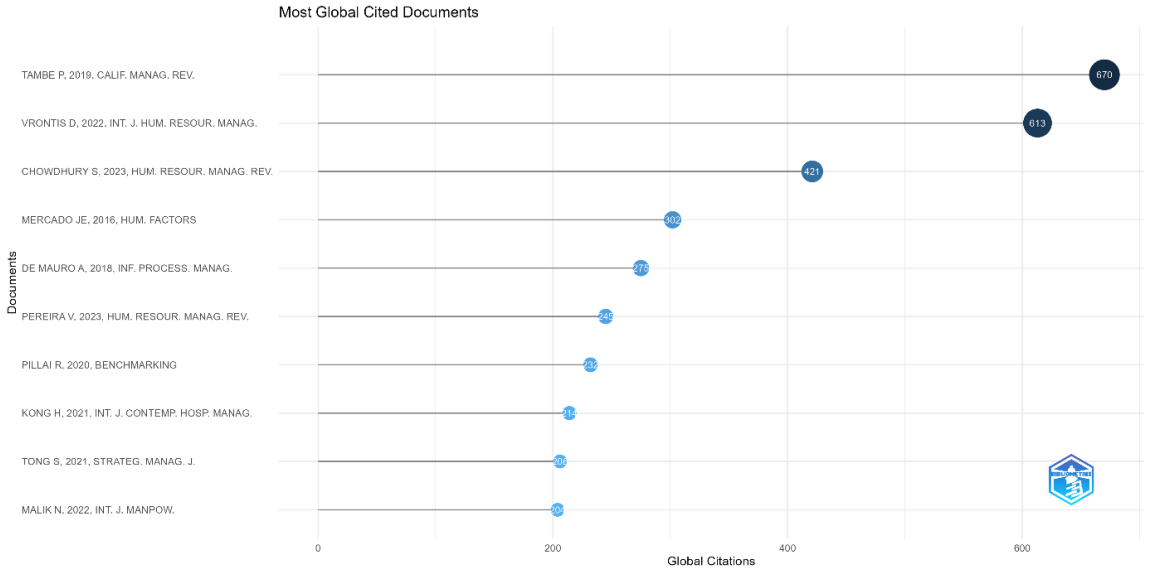
Figure 8: Most cited documents (Bibliometrix)




Source: Scopus database

The analysis of the most globally cited documents in the AI-HRM field highlights a concentrated influence among a few pivotal studies. Leading the citation count is the paper by Tambe (2019) with 670 citations, indicating its foundational role in shaping the discourse around AI in human resource management ( Figure 8). Closely following is Vrontis (2022) with 613 citations and an exceptional citation rate of 153.25 per year, suggesting a recent yet highly impactful contribution. Similarly, Chowdhury (2023) stands out with 421 citations and a high annual citation average (140.33), reinforcing the relevance of newer publications in the evolving research landscape.

Other interesting literature includes Mercado (2016) and De Mauro (2018); although the books are older, they still receive considerable attention, highlighting their enduring impact. The other papers (Pereira 2023, Pillai 2020 and Malik 2022) have slightly less total citations, but are highly cited, indicating strong scholarly interest. These citations not only highlight the role of certain authors and journals as formative in the field, but chart the fundamental theoretical and empirical traditions upon which current fields of inquiry are being built. Overall, the distribution of global citations emphasizes both the historical roots and emerging directions of AI-HRM scholarship.

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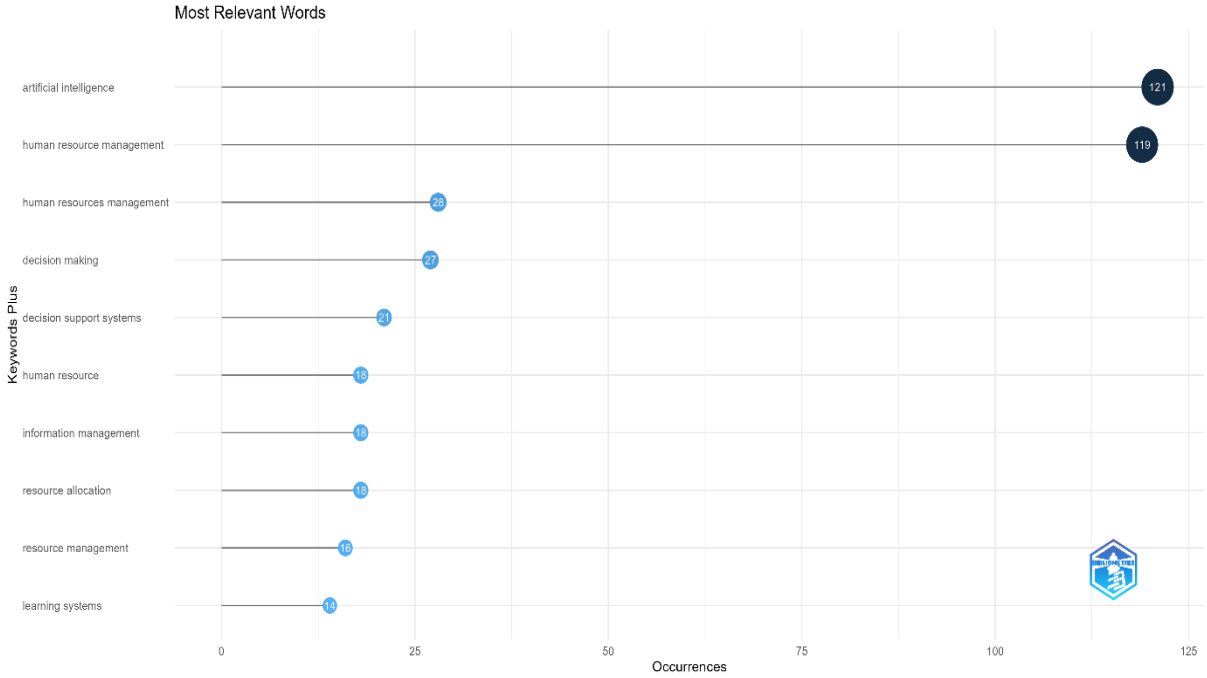
### 3.3 Conceptual Structure and Main Themes (RQ3)

Figure 9 : Most Relevant Keywords (Bibliometrix)




Source: Scopus database

To address RQ3, we employed a co-word analysis based on keyword frequencies, visualized through the "Most Relevant Keywords" plot. This analysis finds that the most frequent terms of the literature are artificial intelligence and human resource management (with 121 and 119 occurrences each), thus confirming their centrality to the research corpus. Furthermore, the terms “decision making”, “decision support systems”, and “information management” are also well represented, indicating a methodological and strategic approach to the subject ( Figure 9). The most frequent terms (those that are included in more than one article) such as resource allocation, learning system, and human resource suggest that attention to operations matters in terms of what Beaudry et al. (2018) see as the use of AI technologies in human resources and other HRM activities and practices. This thematic structure aligns well with recent academic and practical interest in integrating AI-driven systems for improved workforce analytics, talent acquisition, and decision-making frameworks. Overall, the co-word map highlights a convergence of technological and managerial themes, reflecting a maturing field that is moving beyond theoretical exploration into practical implementation.

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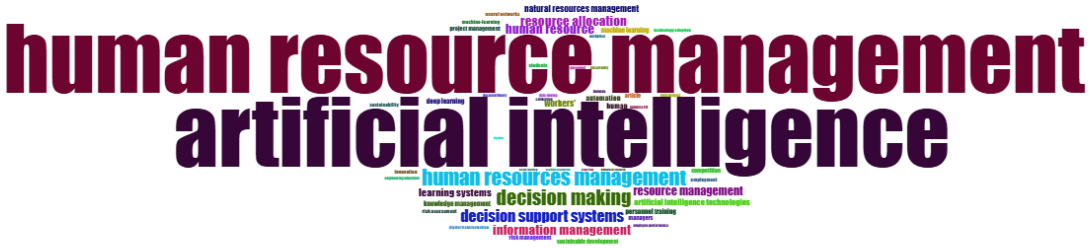
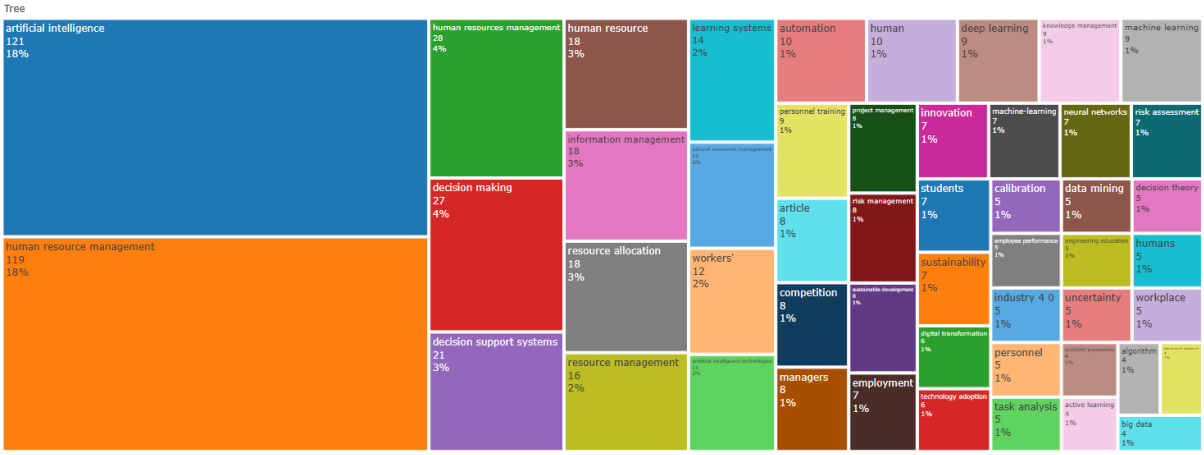
Figure 10: Word Cloud (Bibliometrix)




Source: Elaborated by authors

Figure 11: Keyword Treemap (Bibliometrix)




Source: Elaborated by authors

Together, the two plots (word cloud and thematic tree map) offer a detailed visual presentation of the most prevalent themes in AI-HRM. A tag cloud visualizes the dominance of "artificial intelligence" and "human resource management," presented in bigger font, which visually underlines the central importance of these matters (Figure 10) . This qualitative observation is also quantitatively corroborated by the search results in the tree map where the term "artificial intelligence" is seen 121 times (and 18%) and "human resource management" 119 times (and 18%), thus making the two topics the two most frequently studied. After these, the words "human resources management" (28), "decision making" (27), and "decision support systems" (21) are mentioned significantly, indicating that the managerial decision-making support through the embedded AI is a major focus. Other prominent but much less frequent themes are "information management", "resource allocation" and "learning systems" (between 14 and 18). It also shows upcoming or niche topics, like "chatgpt," "generative artificial intelligence," "ethics" and "workplace," offering a glimpse of the changing concerns and tech trends driving the field forward. Taken together, these figures provide a balanced perspective of core and

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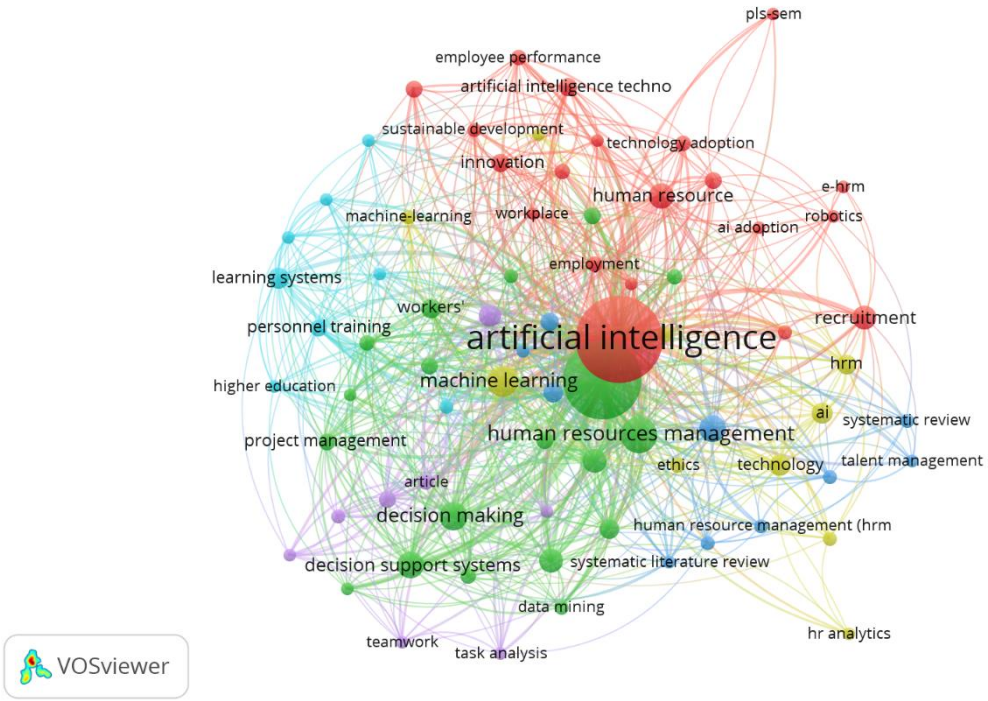
emerging areas that can help readers to determine areas of saturation and emerging areas for future investigation (Figure 11).

Figure 12: Co-occurrence Network Map (VOSviewer)




Source: Elaborated by authors

The co-occurrence map generated by VOSviewer provides a rich visual representation of the intellectual structure of AI-HRM research through keyword clustering( Figure 12). This map shows six key thematic clusters, with separate clusters correspond to different types of scholarly work. Cluster 1 (in red) centers on technology applications and implementation contexts with keywords such as “AI adoption,” “E-HRM,” “employee engagement,” “robotics,” and “technology adoption,” which indicate an interest in how AI is being used in HR practices. Cluster 2 (green) focuses on decision-making and strategic management topics, with words such as “decision support systems”, “data mining”, “resource allocation”, and “risk management”. Cluster 3 (blue) is about method and review study, including “bibliometric analysis,” “systematic review,” “talent management.”Cluster 4 (yellow) focuses on emerging technologies and ethical considerations, with terms like “ChatGPT,” “generative AI,” “ethics,” and “HR analytics,” signaling current debates and innovations. Cluster 5 (purple) includes more operational and team-based dimensions such as “automation,” “task analysis,” and “teamwork.” Finally, Cluster 6 (turquoise) captures educational and training perspectives, highlighted by “learning systems,” “higher education,” and “students.” This clustering not only reflects the

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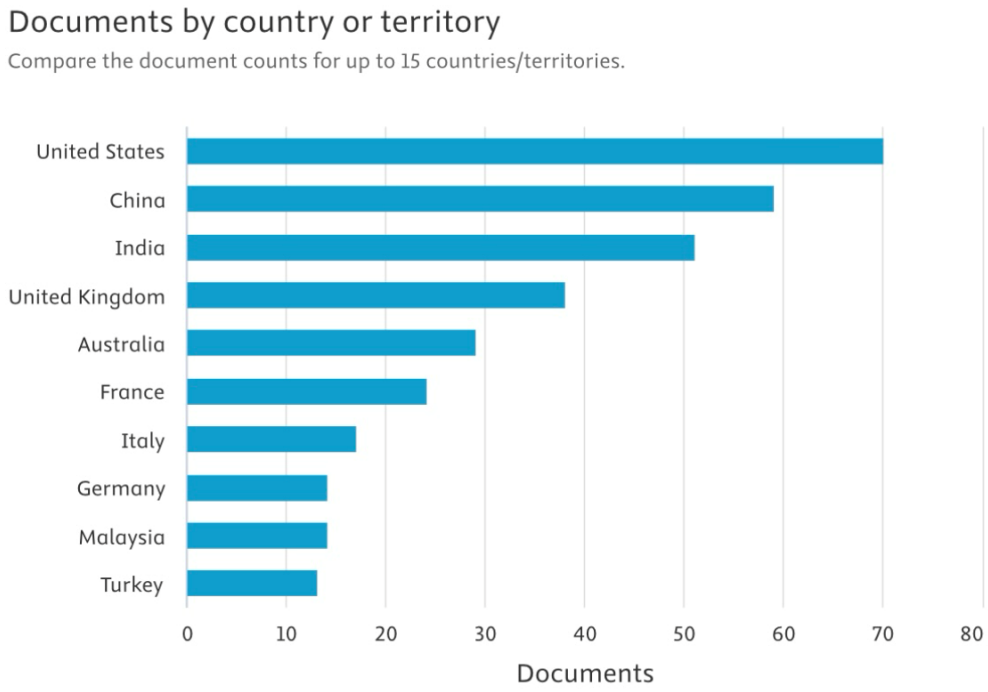
thematic diversity within AI-HRM research but also helps identify interconnected subfields and potential avenues for interdisciplinary exploration. Adding the detailed table with associated keywords per cluster will further clarify the conceptual boundaries and enrich the analysis.

### 3.4 Geographic and Collaborative Leadership (RQ4)

Figure 13: Documents by Country or Territory (Scopus)




Source: Scopus database

The “Documents by country or territory” plot reveals key geographic patterns in AI-HRM research output. The United States leads with 70 documents, reflecting its dominant role in both artificial intelligence innovation and human resource scholarship (Figure 13). China follows with 59 publications, suggesting increasing investment in AI applications for organizational management. India is third with 51 papers, which reflect strong research engagement, probably facilitated by its growing tech and HR sectors.

Interestingly, countries in other European regions such as the UK (38), France (24), Italy (17), and Germany (14) also make a strong contribution, reflecting the wide-ranging applicability of AI-HRM research across various economic and cultural environments. Australia (29) and Malaysia (14) are cast as 'emerging' donors in the Asia-Pacific region, and Turkey (14) is tenth on the list. These numbers reveal that research is spread globally but is concentrated in countries with robust AI ecosystems or mature HRM infrastructure. This geographic spread may reflect differences in institutional capabilities, funding priorities, and workforce

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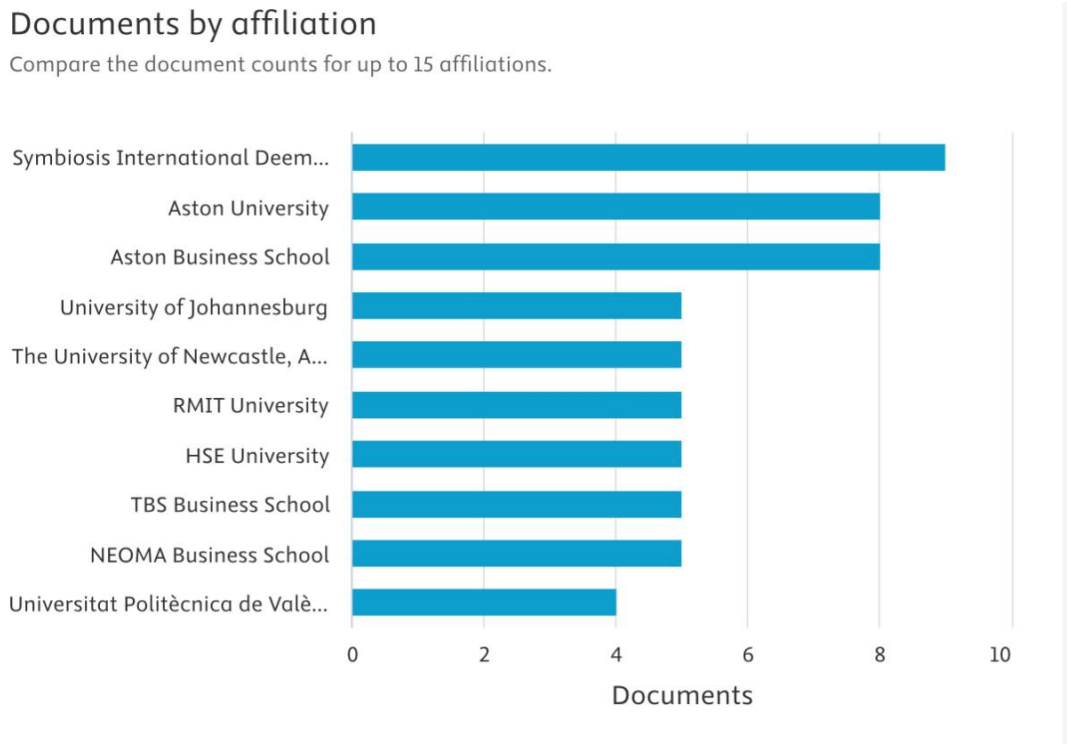
transformation strategies, suggesting potential for future international collaboration and comparative studies in the field.

Figure 14: Documents by Affiliation (Scopus)




Source: Scopus Database.

The "Documents by affiliation" plot identifies the most active institutions in AI-HRM research. Symbiosis International Deemed University has highest number of publications (9), indicating a specific focus on interdisciplinary research relating to technology and HR practices. Hot on its heels are Aston University and Aston Business School with 8 articles apiece, which is a good indicator of the UK's institutional concentration in this area (Figure 14) .

There was a 5-way tie between universities, with University of Johannesburg, The University of Newcastle (Australia) and RMIT University being amongst those in tie that had published at least 5 articles, indicating increasing scholarly interest from both South Africa and Australia. Other entities such as HSE University, TBS Business School, and NEOMA Business School are also showing up with steady contributions, confirming the international and multi-institution character of the research field. This distribution indicates not only academic leadership concentration in a few institutions but also broad international collaboration potential. It reflects how AI-HRM research is being developed across various educational and geographic settings, enabling diverse perspectives and regional priorities to shape the discourse.

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This insight can help future researchers identify potential collaborators and recognize institutional strengths in this rapidly evolving domain.

### 3.5 Research Gaps and Future Directions (RQ5)

Figure 15: Trend Topics Table (Bibliometrix)

Trend Topics

Plot | Table | Biblio AI

Show 10 rows | Excel | Search:

| Term | Frequency | Year (Q1) | Year (Median) | Year (Q3) |
|---|---|---|---|---|
| decision theory | 5 | 2011 | 2012 | 2015 |
| personnel | 5 | 2014 | 2018 | 2019 |
| decision support systems | 21 | 2014 | 2019 | 2023 |
| data mining | 5 | 2014 | 2019 | 2021 |
| learning systems | 14 | 2018 | 2020 | 2022 |
| managers | 8 | 2016 | 2020 | 2022 |
| students | 7 | 2018 | 2020 | 2022 |
| risk assessment | 7 | 2016 | 2021 | 2022 |
| decision making | 27 | 2018 | 2022 | 2023 |
| information management | 18 | 2021 | 2022 | 2023 |

Previous 1 2 Next

Source : Scopus database

The "Trend Topics" table provides useful indications about the evolution and the rise of particular research topics in AI-HRM. Leading topics with a large number of repetitions in the titles are “decision making” (27), “decision support systems” (21), and “information management” (18), suggesting that the academic interest in the potential of AI to support strategic and operational decision processes in HR settings has been strong and long-lasting. Notably, these terms have later median and Q3 publication years (ranging from 2021 to 2023), confirming their relevance in recent literature ( Figure 15).

The temporal progression is particularly revealing earlier themes such as "decision theory" (median 2012) and "data mining" (median 2019) suggest foundational groundwork that has paved the way for more contemporary applications. Conversely, terms like "learning systems" and "students", with median years around 2020 and Q3s as recent as 2022, highlight educational and training dimensions gaining traction in the AI-HRM dialogue.

This trend analysis not only maps the chronological shift in thematic focus but also underlines the field’s responsiveness to technological evolution and workplace needs. Such information can guide researchers in identifying mature topics for synthesis and emergent topics ripe for exploration.

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Figure 16: Keyword Cluster Table (VOSviewer)

| Cluster | Items (Mots-clés associés) |
|---|---|
| Cluster 1 | AI adoption, Artificial intelligence, Artificial intelligence technology, China, Digital transformation, E-HRM, Efficiency, Emerging technologies, Employee engagement, Employee performance, Employment, Human resource, Innovation, PLS-SEM, Recruitment, Robotics, Sustainability, Sustainable development, Technology adoption, Workplace |
| Cluster 2 | Competition, Data mining, Decision making, Decision support system, Decision support systems, Decision theory, Deep learning, Human resource management, Human resources management, Information management, Knowledge management, Managers, Natural resources management, Neural networks, Project management, Resource allocation, Risk assessment, Risk management, Workers |
| Cluster 3 | Artificial intelligence (AI), Bibliometric analysis, Digitization, Human resource management, Human resources, Industry 4.0, Literature review, Systematic literature review, Systematic review, Talent management |
| Cluster 4 | AI, ChatGPT, Ethics, Generative artificial intelligence, HR analytics, HRM, Information systems, Machine learning, Machine-learning, Technology |
| Cluster 5 | Article, Automation, Decision-making, Human, Humans, Resource management, Task analysis, Teamwork |
| Cluster 6 | Big data, COVID-19, Engineering education, Higher education, Learning systems, Personnel, Personnel training, Students |

Source: Elaborated by authors

The keyword cluster table leads a structured view on the gaps and approached for future research in AI-HRM area. Cluster 1 Highest in terms of coverage coefficient, cluster 1 involves the use of AI in HRM (such as AI adoption, E-HRM, digital transformation), however, the lack of depth in longitudinal or empirical studies of validation, particularly when it comes to employee outcomes such as engagement or performance. Further studies may investigate how

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these technology adoptions impact organizational culture or employee well-being in the long term ( Figure 16).

Cluster 2 represents a major focus on decision-making models and tools such as decision aid systems and evidence-based resource allocation. YetHowever, this also suggests a potential lack of empirical prima facie and a potential over-reliance on secondary data demonstrating the necessity for humanistic qualitative or blended methods studies to comprehend lived experiences of AI-HR transition.

Cluster 4's focus on ethics, ChatGPT, and generative AI highlights emerging themes, but also signals lightly touched upon matters such as algorithmic bias, AI accountability in HR decisions, and employee surveillance. This is uncharted territory for normative and policy science.Cluster 5 highlights team-level and task-related dynamics but lacks connection to broader organizational strategy or agility. Research could link these operational aspects to strategic HR outcomes such as innovation capacity, retention, or organizational learning.

Cluster 6 is focused on training and education, which is essential yet underdeveloped in terms of organizational investment models, return on AI training, and adaptation across different HR contexts (e.g., SMEs vs. large firms).

Overall, these clusters not only map the current state of the field but also reveal blind spots—especially the human and institutional dimensions of AI adoption in HRM. Addressing these will help bridge theory with practical, sustainable implementation in diverse organizational settings.

Figure 17: Summary of Research Questions, Main Findings, and Supporting Figures

| Research Question | Summary Answer | Key Figures/Plots |
|---|---|---|
| RQ1: What is the volume and temporal evolution of scientific production in AI-HRM research from 2010 to 2025? | Scientific output significantly increased after 2018, showing exponential growth aligned with digital transformation trends. | Figure: Annual Scientific Production (Bibliometrix) |
| RQ2: Who are the most productive and influential authors, journals, and institutions? | Authors such as Pawan Budhwar and Ashish Malik are most productive; USA, UK, and India lead institutionally. | Figures: Most Relevant Authors & Country Scientific Production (Bibliometrix) |

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| | | |
|---|---|---|
| RQ3: What are the most explored themes and their intellectual structures (co-word analysis)? | Main themes include decision-making, talent management, ethics, and systematic reviews; six keyword clusters identified. | Figures: Keyword Treemap, Word Cloud, Co-occurrence Map (VOSviewer) |
| RQ4: What countries and institutions are leading collaboration networks? | USA, India, and UK dominate; limited collaboration networks and low Global South participation. | Figures: Country Collaboration Map, Documents by Country (Bibliometrix) |
| RQ5: What gaps can be identified for future research, particularly from an organizational perspective? | Lack of geographic diversity (esp. Africa/MENA), underexplored HR functions, need for interdisciplinary research. | Table: Keyword Clusters (VOSviewer); See Synthesis in Section 5 |

Source: Elaborated by authors.

## 4. Discussion

### 4.1 Trends in AI-HRM Scientific Output (RQ1)

Looking at the trend from 2010 to 2025, the development of scientific production in AI-HRM shows a clear acceleration and step-change post-2018. This rise is amidst the global push for digital transformation due to the COVID-19 pandemic. This was the time when Artificial Intelligence technologies transformed into a strategic asset for companies as organizations began to delve into algorithmic remedies to workforce planning, performance tracking, and talent management. The peak in publications around 2021-2024 also proves the transition of the field into a mature interdisciplinary study.

In an IO sense, this expansion can be understood as part of a more fundamental shift in the structure of decision-making in firms.When interpreted through the lens of Industrial Organization (IO), this growth reflects a deeper structural shift in decision-making within firms. As AI tools become embedded in core HRM functions, they alter traditional authority chains. Decision-making becomes more decentralized and data-driven, shifting power from middle management to algorithmic systems. Such a transformation not only transcends HR functions but also reshapes the structure of managerial control, converging with IO's focus on firm behaviour, coordination, and internal labour markets.

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The citation profile underlines key periods in the development of the field—especially around 2016 and 2022—when breakthrough contributions that presumably introduced conceptual or methodological novelties are likely to have been published. Remarkably, given the increase in literature, and dominance of Anglo-American institutions, it also points to a knowledge centralization, fueling concerns about representational equity in academic research.Moreover, the limited presence of research from Africa and MENA regions underscores a gap in global inclusivity and relevance. As AI continues to reshape how firms manage human capital, the lack of regionally grounded studies risks overlooking critical socio-economic contexts. The next stage of bibliometric monitoring should thus focus not only on quantitative expansion but also on tracking the strategic and institutional influence of AI-HRM research across diverse economies and organizational types.

### 4.2 Leading Contributors and Institutional Output (RQ2)

The bibliometric analysis identifies a high concentration of scholarly output and influence among a limited number of authors and institutions, primarily based in the United States, United Kingdom, and India. Authors such as Budhwar and Malik stand out with seven publications each, while institutions like Symbiosis International and Aston University emerge as prolific research hubs. This centralization of academic leadership mirrors classic industrial organization patterns, where a small group of actors dominates knowledge production and shapes the discourse. In terms of IO, this is a kind of intellectual oligopoly, where reputational capital, resources exist in conjunction with each other and with an exclusive market approach, gating newer and under-represented parties. The English-speaking, highly funded university-based major Heading laboratories make a very high threshold for entry for researchers based in the less developed regions of the world, specifically Africa and the MENA region. This asymmetry questions of both the epistemological diversity of AI-HRM research and its ability to capture diverse labor market dynamics, different governance systems and HRM practices.

Despite the impressive volume of publications from these leading institutions, collaborative ties remain relatively insular. There is limited evidence of cross-continental research networks or interdisciplinary consortia. This is problematic, given that AI-HRM intersects not only with management but also with information systems, ethics, and labor economics. The lack of international cooperation may constrain theoretical innovation and practical applicability.

To enrich the field and reflect the diverse industrial landscapes where AI is deployed, future research must foster broader institutional collaboration. This includes integrating perspectives from emerging economies, forming multi-sectoral research teams, and encouraging publication

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platforms that support non-Western scholars. Encouraging more open, pluralistic academic ecosystems would align better with the organizational complexity AI introduces into HR functions—diverse inputs are needed to capture equally diverse impacts.

### 4.3 Thematic Structures and Intellectual Focus (RQ3)

The co-word analysis reveals a rich and evolving thematic structure in AI-HRM research, structured into six major clusters that span conceptual, methodological, and practical domains. The most prominent clusters address themes such as AI adoption in HR contexts (Cluster 1), strategic decision-making and management systems (Cluster 2), and methodological syntheses such as bibliometric and systematic reviews (Cluster 3). These themes reflect a maturing field where technical innovation meets organizational theory, a dynamic particularly relevant from an Industrial Organisation (IO) perspective.

Cluster 1 underscores the transformation of HR functions through AI integration, pointing to changing workplace structures, new efficiencies, and shifting patterns of employment. Cluster 2 introduces key decision-making frameworks and the increasing use of AI in data-driven HR strategies—highlighting a redistribution of decision-making authority from managers to algorithmic tools. This resonates with IO themes of power centralization, information asymmetry, and the optimization of organizational processes.

Meanwhile, Cluster 4 highlights emerging concerns around generative AI, ethics, and machine learning—topics that are gaining visibility but are still underexplored. Clusters 5 and 6 introduce operational and educational concerns, reflecting how AI impacts teamwork, training, and human-machine collaboration.

Despite this diversity, thematic gaps persist. Interdisciplinary integration remains limited, with ethics and social science perspectives often isolated from technical discussions. Moreover, the dominance of general terms like “human resource management” and “decision-making” suggests that many studies address high-level strategy without delving into functional HR domains such as compensation, onboarding, or conflict resolution.

In sum, the field is conceptually rich but still lacks thematic granularity and disciplinary convergence. To advance, future research should connect emerging AI applications with foundational HR theories, while embracing input from fields like sociology, law, and organizational psychology. This will help explain not only how AI is used, but also how it redefines organizational logic and labor structures.

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### 4.4 Collaboration Networks and Country-Level Insights (RQ4)

The geographic and institutional analysis of the AI-HRM literature reveals a highly asymmetric global research landscape. The US, China and India are the leaders in terms of number of scientific publications, and Europe, predominantly through the UK, France and Germany. Nevertheless, networking is by no means homogeneous, and there is only a moderate amount of cross-border cooperation. From an Industrial Organization (IO) perspective, this pattern mirrors the dynamics of oligopolistic markets, where a few dominant players control the majority of resources and influence.

The co-authorship and institutional affiliation maps show that the most productive authors often work within isolated national ecosystems, with limited evidence of sustained international research alliances. This insularity limits knowledge diffusion and the cross-pollination of diverse methodological approaches or cultural contexts. The result is a form of intellectual path dependency: dominant paradigms tend to be reproduced rather than challenged or diversified.

Notably, African, Latin American, and MENA countries are relatively marginalised. These are either not present or underrepresented in their datasets. And in terms of AI-HRM this means that the generalizability of AI-HRM insights now comes into question, as well as HR practices and labor markets in those regions vary greatly from those in the Global North. Topics such as the informal workforce, the tech infrastructure and regulatory infrastructure have been almost entirely ignored in popular publications.From an IO angle, this lack of inclusion distorts the understanding of how AI reshapes organizational behavior across different economic systems. It also perpetuates knowledge asymmetries, reinforcing a cycle where institutional resources, visibility, and publication access remain concentrated in the hands of a few.

To promote a more balanced and globally relevant research ecosystem, greater emphasis must be placed on supporting transnational research partnerships, regional capacity building, and inclusive publication practices. Only through such efforts can AI-HRM scholarship reflect the diverse realities of modern organizations.

### 4.5 Research Gaps and Future Opportunities (RQ5)

Although the AI-HRM literature has grown significantly in the past decade, various important gaps still exist—whatever the theme's emphasis and geography. One important insight from the bibliometric mapping is the relative underrepresentation of research focused on the Global South, and in particular, Africa and the MENA region. Such an absence not only restrains the wider applicability of results, but also leads to the exclusion of alternative labor structures and

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institutional contexts, which at least have the potential of producing new theoretical and practical approaches.

Functionally, much of the existing research centers on strategic decision-making, talent management, and digital transformation. However, granular HR functions such as onboarding, compensation, labor relations, or employee well-being are comparatively neglected. These operational dimensions are essential for understanding how AI alters everyday HR practices, power dynamics, and organizational behavior—key interests in Industrial Organisation (IO). For instance, the use of AI in performance evaluation or disciplinary actions introduces new mechanisms of surveillance and control, reshaping traditional employer-employee relationships.

The thematic clusters also indicate an emerging—but still limited—engagement with ethical, legal, and societal concerns. Generative AI, and tools such as ChatGPT are only just being talked about, and typically in isolation to core HR strategy. This indicates an urgent need for interdisciplinary study, linking HRM to sociology, law, data ethics, and information systems. Apart from that, there is the risk that AIHRM research will only contribute to the ongoing construction of a a technocentric narrative that ignores human values, fairness, and the regulation complexity.To fill these gaps, I recommend that future work focus on three directions: (1) studies contextualized by region, particularly those outside of the Western labor market, (2) further development of the implications of AI for intra-organizational power and decision-making, and (3) interdisciplinary models that combine ethical, technical and behavioral approaches. Not only will these efforts help to enhance the field, but they will also contribute to bringing AI-HRM research in line with the overarching, structural concerns that drive the modern Industrial Organization literature.

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## 5. Conclusion

In examining 354 articles in Scopus (2010–2025), this bibliometric analysis provides an organized view of the successive ways AI is transforming HRM, not only in academia, but also in organizations. Based on quantitative mapping and thematic visualization with Bibliometrix and VOSviewer, this research has clarified five main research issues related to scientific output, major contributors, conceptual structures, international cooperation, and emerging research gaps.

The results show a rapidly changing research environment, motivated by digital transformation and the evolving workforce in the post-pandemic era. At the thematic level, AI-HRM research coalesces around decision-making, digital recruitment, learning systems, and ethics, capturing both technological aspiration and organizational anxiety. The discourse is dominated by major institutions – largely in the US, Europe and India – with a significant deficit in the representation of Global South countries, particularly in Africa and MENA nations. This demands more of global inclusion in order to allow generalizability and relevance of results.

From an industrial organization point of view, AI and the implementation of AI in HRM is not just a technological revolution, it is a structural revolution. The re-allocation of decision rights, automation of core tasks, and centrality of algorithmic governance after all, imply a reconfiguration of internal labor markets, power relations, and firm behavior. However, much of the current research is still macro-oriented and pay little attention to functional specificities as well as implications at the employee level.

This research also reveals the necessity for the interdisciplinary cooperation integrating law, sociology, data ethics and organizational psychology to encompass AI's full scope of influence on human capital. The field could be enriched if under researched HR practices are valued, including compensation, employee relations and conflict resolution, supported by detailed and region-oriented case study research.

Finally, this paper presents a research agenda for future AI-HRM studies, promoting a more pluralist, context-specific and theoretically informed research schedule. It guides academicians and practitioners away from fragmented analyses toward more comprehensive systems of concepts that permit both academic rigor and managerial relevance. Connecting tech to org, the future of AI in HRM is found not just in smarter systems but in scholarship that is smarter, that is more Jacuzzi and less exclusionary

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