

Artificial Intelligence in Human Resource Management (2020 - 2025): A Bibliometric Analysis of Global Research Trends

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Abstract

The growing adoption of Artificial Intelligence (AI) in Human Resource Management (HRM) is transforming HR practices in private sector organisations. In response to this evolution, this study conducts a bibliometric analysis to assess how far research on AI in HRM has developed and to provide a structured vision about the thematic for future HR researchers. The objective is to utilize this study as a benchmark approach for developing educational technics evaluate the implementation of AI in HRM, by mapping the current state of knowledge and to derive insights that can inform the future development of HR personnel and practices. A systematic literature review was carried out using the Web of Science database. After applying filters related to publication period (2020-2025), document type, subject areas, and open-access availability, a final sample of 230 articles and review articles was retained. Science-mapping techniques were used to analyse publication trends, authorship, sources, citations, countries, institutions, and keyword co-occurrence. The findings show a rapidly expanding and multidisciplinary field, with a strong focus on recruitment, employment processes, and performance management supported by AI. In contrast, topics related to governance, algorithmic bias, and legitimacy remain less central but are gaining increasing attention. By visualizing these patterns, the study provides a clear overview of the development and orientation of the field. In general, this research offers a learning perspective on AI in HRM, helping organisations and HR professionals better understand current trends and adapt their skills, roles, and practices to the evolving integration of AI in the workplace.

Keywords: AI, HR management, bibliometric analysis, recruitment, HR analytics, adoption

1. Introduction

Human resources management have integrated artificial intelligence in re-constructing how organizations recruit, evaluate, support and retain employees using data-driven tools and automated decision support (Huang et al., 2023; Sharma et al., 2025). In practice, HR technologies based on AI algorithms are used to scale staffing processes, enhance analytics for performance and retention decisions, and redesign HR service delivery (Wenting et al., 2024; Baydili & Tasci, 2025; Malik et al., 2022).

The literature shows that the integration of artificial intelligence in Human resources management is viewed as a socio technical shift rather than a technological enhancement. Its value depends on how organizations translate algorithmic capabilities into routines and decision architectures, and how HR analytics is governed and integrated into managerial practice (Trocin et al., 2021; Huang et al., 2023). Staffing remains the most visible application domain: adoption research highlights the roles of perceived usefulness, compatibility, and risk perceptions (Tanantong & Wongras, 2024; Kumari et al., 2025), while fairness and bias studies emphasize that trust and accountability shape whether algorithmic selection is accepted (Cai et al., 2024; Revillod, 2024; Soleimani et al., 2025). Beyond recruitment, the growing use of predictive and explainable models for retention and performance decisions reinforces the need for defensible interpretation in high-stakes HR contexts (Baydili & Tasci, 2025). On the other hand, evidence on HR professionals' beliefs and organizational acceptability indicates that implementation outcomes are contingent on responsibility allocation and perceived legitimacy, particularly when AI is perceived as surveillance (Malin et al., 2023; Revillod, 2025; Poisat et al., 2024). Emerging discussions of generative AI further intensify these questions by extending AI's role into interactive and content-generating HR applications (Bou Zakhem et al., 2025; Koteczki et al., 2025).

While there has been exponential growth in private sector HRM research on the topic of AI, most of the research has been dispersed across multiple streams of research, with little attempt to synthesize findings to advance our understanding of the technology and its impacts on HRM. A bibliometric approach is therefore appropriate to systematically map publication dynamics and the field's conceptual structure during 2020-2025 (Prikshat et al., 2023; Benabou & Touhami, 2025). This study is the first to generate a global bibliometric map AI in HRM

research conducted in private and for-profit contexts over the 2020-2025 period based on Two research questions and two alternative hypotheses (H1 and H2)

1.1. Research questions

- RQ1: How has scientific production on AI in HRM evolved since 2020?
- RQ2: What are the primary thematic clusters and trending topics in private-sector HR?

1.2. Hypotheses

- H1: Scientific production on AI in HRM has increased since 2020, reflecting the gradual development of the field.
- H2: The literature on AI in private-sector HRM is structured around two main thematic orientations: a central stream focused on operational HR applications and on governance issues (*fairness, bias, transparency, accountability, and privacy.*)

2. Literature review

2.1. AI in HRM as a Socio-Technical and Analytical Architecture

Throughout the literature, Artificial intelligence in Human resources management is consistently framed less as a simple technology than technical structure embedded in HR systems and routines. Its organizational effects depend on how firms translate algorithmic capabilities into redesigned processes, services, and decision rights rather than on technical potential alone (Trocin et al., 2021). HRM and organization-design perspectives similarly stress that AI reshapes how HR decisions are produced and justified by reallocating tasks between human judgment and automated inference (Prikshat et al., 2023; Tinguely et al., 2023). Within this architecture, HR analytics is not merely measurement but a managerial capability: it links workforce data to interventions and enables, in some cases, more personalized HR policies, provided organizations have sufficient data governance and interpretive competence (Huang et al., 2023; Sharma et al., 2025). While AI's analytical capacity is a clear asset, it creates at the same time, an obligation for transparency, as interpretability and explainability are essential to legitimizing AI-driven outcomes in sensitive HR decisions (Baydili & Tasci, 2025). The literature demonstrates that the more capacities are delegated to AI systems, the more the need for accountability and justification of decisions, especially when decisions affect opportunities and careers (Cai et al., 2024; Leszczyński & Gaczek, 2025). Generative AI extends these issues by enabling interactive and content-generating HR applications that expand usefulness while

amplifying reliability and responsibility concerns (Bou Zakhem et al., 2025; Koteczki et al., 2025).

2.2. The Staffing Lifecycle: Recruitment and Talent Acquisition

Integrating AI in staffing is the most eminent application area in the literature, reflecting pressure in private firms to scale hiring while improving consistency. Studies indicate that intentions to use AI in recruitment are shaped by perceived usefulness, compatibility, ease of use, and concerns about risk and privacy, suggesting that diffusion is contingent rather than automatic (Tanantong & Wongras, 2024; Kumari et al., 2025). Research also shows that interface and interaction features such as anthropomorphism can influence acceptance and perceived recruitment efficiency (Dalain & Yamin, 2025). Yet staffing is also where legitimacy tensions are most visible. Studies of algorithmic resume screening highlight that perceived fairness depends on how algorithmic decisions are understood and trusted, not only on promised objectivity (Cai et al., 2024). Evidence of organizational reluctance toward recruitment algorithms reinforces that professional norms and accountability concerns can constrain adoption even under strong efficiency incentives (Revillod, 2024). Work on bias mitigation frames fairness as a socio-technical governance problem requiring organizational learning and knowledge-sharing practices, rather than a purely technical correction (Soleimani et al., 2021; Soleimani et al., 2025). Beyond selection, AI is increasingly discussed as part of end-to-end talent acquisition systems, linking sourcing, screening, and candidate management into integrated pipelines (Choudhari et al., 2025).

While staffing concerns entry into organization, talent management focuses more on the development and continuity of workforce capability. Research suggests that attention to talent becomes particularly a necessity in AI competitive environments, implying co-evolution between talent systems and AI-driven business models (Alruwaili & Mokni, 2024). More broadly, HR digitalization and HRIS effectiveness studies indicate that AI-enabled talent systems depend on coherent infrastructures, information quality, and organizational capabilities that support sustainable digital transformation (Angelova et al., 2023; Siddique et al., 2025). Complementary work on automation and future skills needs further implies that staffing and talent strategies increasingly hinge on continuous reskilling and on HR's capacity to anticipate evolving competency demands (Bukartaite & Hooper, 2023).

2.3. Organizational Outcomes: Performance and Employee Experience

The corpus links AI in HRM to organizational outcomes through two intertwined pathways: performance-oriented decision support and employee experience. AI is described as expanding measurement and prediction capabilities in domains such as training, appraisal, and retention management, thereby supporting more data-driven performance decisions (Singh & Shaurya, 2021; Wenting et al., 2024). Optimization-oriented perspectives also appear in compensation and benefits, where AI is framed as enabling more systematic reward decision-making aligned with organizational objectives (Nayak & Jagadeeswari, 2023). However, the literature emphasizes that performance gains are not self-validating in HR: because HR decisions are high-stakes, legitimacy and transparency shape whether AI-mediated evaluation is accepted. Explainability is therefore positioned as central to managerial decision-making rather than peripheral (Baydili & Tasci, 2025).

Employee experience research complements this view by showing that AI can reorganize HR service delivery through integrated ecosystems, affecting how employees perceive support, responsiveness, and fairness (Malik et al., 2022). Sustainability-oriented work further extends the outcome frame, linking AI-enabled HR initiatives to employee engagement and to organizational sustainability agendas, particularly in green HRM contexts (Anjani, 2025; Housheya & Atikbay, 2025). Based on what have been said, these studies shows that AI's organizational impact in HR is interpreted by a balanced mix of performance efficiency and employee-centered dynamics.

2.4. The Governance Frontier: Responsibility, Trust, and Acceptability

Across the literature, governance consistently emerges as a central concern, especially in relation to bias, accountability, privacy, and trust. Bias and fairness debates emphasize that algorithmic discrimination can emerge through socio-technical development pathways, requiring organizational practices such as knowledge sharing and iterative governance to mitigate both cognitive and algorithmic biases (Soleimani et al., 2021; Soleimani et al., 2025). Transparency and accountability are framed as conditions of defensible AI use, particularly where HR decisions affect careers and well-being, reinforcing the need for explainable and auditable decision support (Baydili & Tasci, 2025; Tinguely et al., 2023). Privacy concerns appear both as adoption determinants and as sources of perceived surveillance, indicating that

trust can be undermined when data-intensive HR analytics is interpreted as monitoring rather than support (Kumari et al., 2025; Poisat et al., 2024).

Acceptability research underscores that adoption depends on how HR professionals and organizational stakeholders evaluate AI's appropriateness and the distribution of responsibility in human–AI decision processes (Malin et al., 2023; Revillod, 2025). Evidence of skepticism toward recruitment algorithms highlights that resistance can be grounded in professional norms and accountability risk rather than in simple unfamiliarity (Revillod, 2024). At the same time, HR digitalization research shows that expectation gaps between employees and employers can shape the social sustainability of AI-enabled HR practices (Angelova et al., 2025). These governance and acceptance issues intersect with role reconfiguration: as AI diffuses, HR professionals are increasingly expected to develop competencies related to automation and algorithmic systems, while organizational orientations toward innovation can condition AI implementation trajectories (Ghosh & Kabra, 2025; Baldegger et al., 2020). Empirical evidence also suggests that AI can affect HR performance, but outcomes remain contingent on deployment choices and governance capacity (Li et al., 2023). Altogether, the literature indicates that the field is structured by around optimization and legitimacy, which justifies bibliometric mapping as a means to clarify how adoption, HR practice transformation, and responsible-AI concerns connect within the literature (Prikshat et al., 2023; Benabou & Touhami, 2025).

3. Materials and Methods

3.1. Research design and bibliometric approach

This study conducts a bibliometric analysis of AI applications in Human Resource Management (HRM) within private organisations worldwide, covering the period 2020-2025. Bibliometrics was selected as the methodological approach given its capacity to systematically and quantitatively map publication trends and knowledge structures within emerging and rapidly evolving fields. By analysing bibliographic data from published works, this study aims to identify dominant themes, research trajectories, and knowledge gaps in the AI-HRM literature. Therefore, this study sought to answer two research questions:

- RQ1: How has scientific production on AI in HRM evolved since 2020?
- RQ2: What are the primary thematic clusters and trending topics in private-sector HR?

This study employed descriptive performance analysis (DPA) and science-mapping approaches to examine the structure of the research domain, the co-occurrence patterns of the topics, and the evolution of research focus over time. All indicators and networks derived in this study were based on the output of Bibliometrix/Biblioshiny tools, which were derived from the Bibliometric results of the WoS data export.

3.2. Data source

By 23 January 2026, the bibliographic dataset was retrieved from the Web of Science (WoS) platform, selected for its multidisciplinary coverage and structured indexing that facilitates field delimitation through standardized categories. WoS also provided consistent metadata fields required for the bibliometric mapping, including author information, affiliations, keywords, cited references, source titles, and document-type classifications. The database was used as the single source of records to maintain internal consistency in indexing rules, document classification, and category assignment across the entire dataset.

3.3. Search strategy

A topic search strategy was implemented to capture publications explicitly addressing artificial intelligence in human resources. The query TS= ("Artificial Intelligence") AND TS= ("Management" AND "Business" AND "Environmental Sciences" AND "Social Sciences" AND "Interdisciplinary" AND "Economics and finance") was defined to target the intersection of artificial intelligence and human resource management within WoS searchable fields that typically include title, abstract, and keywords. This initial retrieval stage yielded a corpus of $n=2627$ documents. At this stage, the search was intentionally broad within the AI-HR intersection in order to maximize recall before applying stepwise refinement criteria aligned with the study scope.

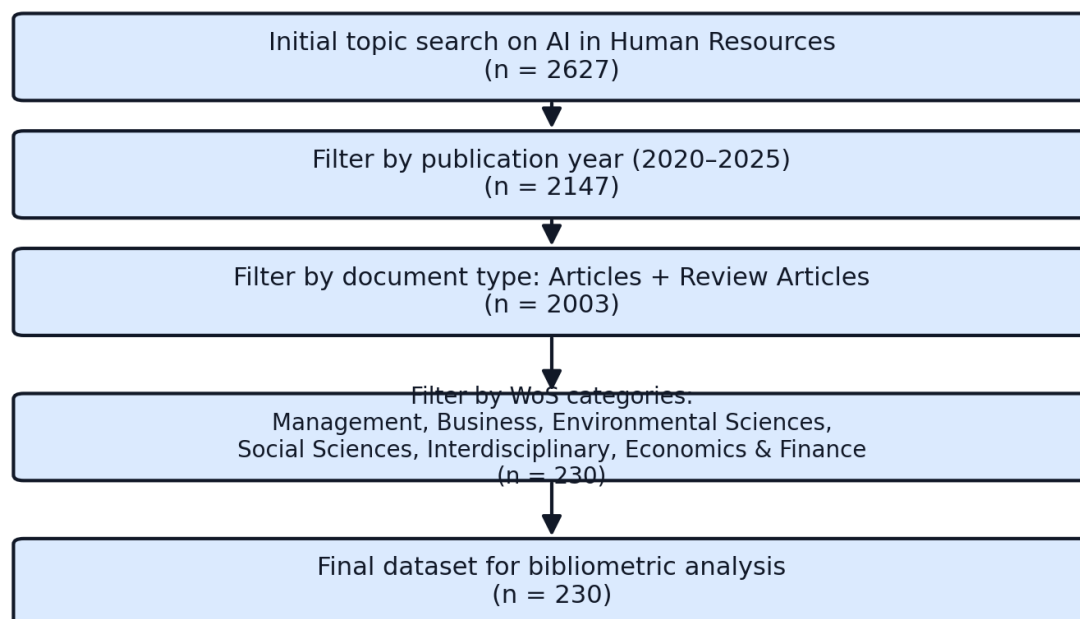
3.4. Stepwise dataset refinement

To ensure that the final dataset matched the study's scope and quality requirements, the initial retrieval was refined through a sequential filtering protocol; at each step,

n denotes the number of documents retained after applying the corresponding criterion.

The first refinement step applied subject-area delimitation to preserve the focus on AI in HRM and to minimize spillover from AI-intensive domains whose objectives, regulatory environments, and evaluative criteria differ substantially from those of private-sector human

resource management. In particular, “*medical, financial, and agricultural*” applications were excluded because their primary concerns relate to clinical diagnosis, financial forecasting, or production optimization rather than to HR processes such as recruitment, talent management, performance evaluation, employee experience, or HR governance. Including these domains would have deviate the research trajectory and reduced the comparability for the bibliometric mapping. This stage therefore corresponds to the initial AI–HR intersection defined by the search strategy, with $n = 2627$ (see figure 1).



Source: Created by authors

Figure 1. Diagram of the Selection / Filtering Process

The second refinement step restricted the corpus to the study window by retaining only publications issued between 2020 and 2025, thereby capturing the most recent phase of AI diffusion in HR and ensuring temporal comparability during a period marked by accelerated organizational adoption and intensified governance debates ($n = 2147$).

The third refinement step limited document types to peer-reviewed articles and review articles, excluding formats that typically provide incomplete empirical reporting or limited theoretical development, and thereby strengthening the analytical robustness of subsequent mapping ($n = 2003$).

The fourth refinement step applied field selection using Web of Science categories to ensure that the dataset remained aligned with the study’s managerial and organizational focus. Only records classified under *Management, Business, Environmental Sciences, Social Sciences*,

Interdisciplinary, and Economics and Finance were retained, while studies rooted mainly in technical or non-HRM domains were excluded. This step strengthened the comparability of the dataset by keeping publications that examine AI in relation to HRM as an organizational and decision-making function, resulting in a reduced and more focused set of $n = 230$ documents.

This strategy results in a focused corpus suited to rigorous bibliometric synthesis despite its smaller size, reflecting the study's emphasis on a tightly defined private-sector HRM scope and on research outputs that offer complete, peer-reviewed scholarly contributions ($n = 230$).

3.5. Data extraction and preparation

All records meeting the final inclusion criteria ($n = 230$) were exported from Web of Science with full bibliographic metadata and cited references. Prior to analysis, records were checked for basic consistency in author names, keywords, and source information to reduce avoidable fragmentation in mapping outputs. Where relevant, normalization procedures were applied to harmonize equivalent keyword variants and reduce noise in co-word structures, without altering the data content.

3.6. Bibliometric analysis procedures

The analysis was structured around two successive layers. First, descriptive bibliometric profiling was used to characterize the data obtained in terms of publication dynamics and the distribution of research output across the period of interest. Second, science-mapping techniques were used to support a structured reading of the field's conceptual and relational organization, including co-authorship patterns, co-citation structures, and keyword co-occurrence networks. To implement these procedures in the study we used Biblioshiny the web-based interface of the R package bibliometrix to analyze and map the bibliographic metadata extracted from the final dataset. Biblioshiny was employed to generate core performance indicators (productivity by authors, sources, institutions, and countries) and to produce network-based visualizations that represent collaboration and intellectual structure. These outputs are interpreted with the help of artificial intelligence, as field-level representations of scholarly attention and intellectual proximity, rather than direct evidence of causal influence.

Because bibliometric findings depend on computational procedures, thresholds, and parameter settings, all maps and indicators obtained in the results are derived from the bibliographic data file associated with the final dataset.

4. Results

This section presents the key findings of the bibliometric analysis. It provides an overview of the evolution of scholarship on artificial intelligence in human resource management within private-sector contexts over the 2020–2025 period. Drawing exclusively on the final dataset retained after the stepwise refinement process ($n = 230$), the analysis combines descriptive indicators with science-mapping outputs to examine the structure and dynamics of the field. The results, therefore summarize publication activity across the study window, the main dissemination outlets and their evolution over time, and the collaborative configuration of the research community through co-authorship patterns, while also exploring the conceptual architecture of the domain through keyword co-occurrence networks and thematic representations. All metrics, visualizations, and network properties presented in the subsections that follow are computed directly from the exported bibliographic records and are interpreted as evidence of patterns of scholarly attention and intellectual proximity, rather than as causal proof of substantive effects in organizations.

4.1. Annual scientific production

Figure 2 presents the annual scientific production on AI in private-sector HRM over the 2020–2025 period. The figure shows a clear upward trend, with publication output rising from about 5 articles in 2020 to around 10 in 2021, 11 in 2022, 18 in 2023, just above 20 in 2024, and reaching a peak of more than 50 articles in 2025. This pattern indicates that the field moved from a relatively limited research base to a much more visible and active area of scholarship, especially in the later years of the period. As Figure 2 suggests, this acceleration is consistent with the growing organizational uptake of AI in HR functions and with increasing scholarly attention to both operational applications and governance-related issues in private-sector HRM.

4.2. Most relevant sources

As Figure 3 shows the most relevant publication sources in the dataset by number of documents. The figure shows that Sustainability is the leading outlet with 9 documents, followed by Administrative Sciences with 8, and the International Journal of Environmental Research and Public Health with 6. A second group of sources contributes moderately, including Entrepreneurship and Sustainability Issues with 5 documents and three outlets with 4 documents each: The International Journal of Human Resource Management, the SA Journal of Human Resource Management, and Systems. This distribution indicates that research on AI

in private-sector HRM is concentrated in a limited set of journals while remaining spread across HRM, management, systems, and sustainability-oriented outlets. As Figure 3 shows, the field is not developing within a single disciplinary channel; rather, it is being shaped by multiple publication communities, which helps explain both its multidisciplinary character and the fragmentation of its conceptual approaches.

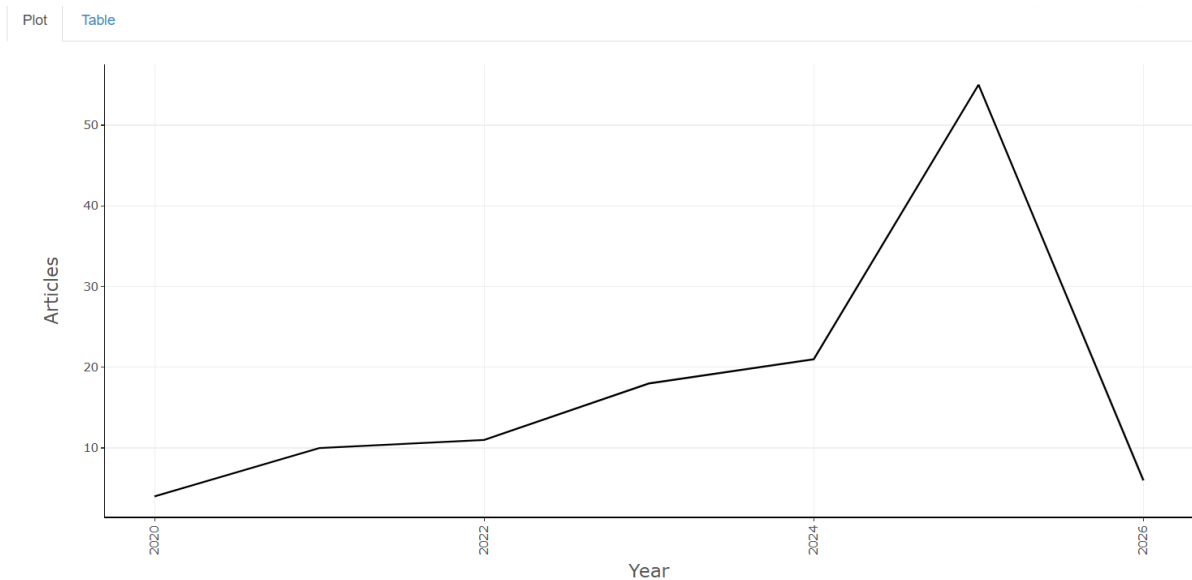


Figure 2. Annual scientific production

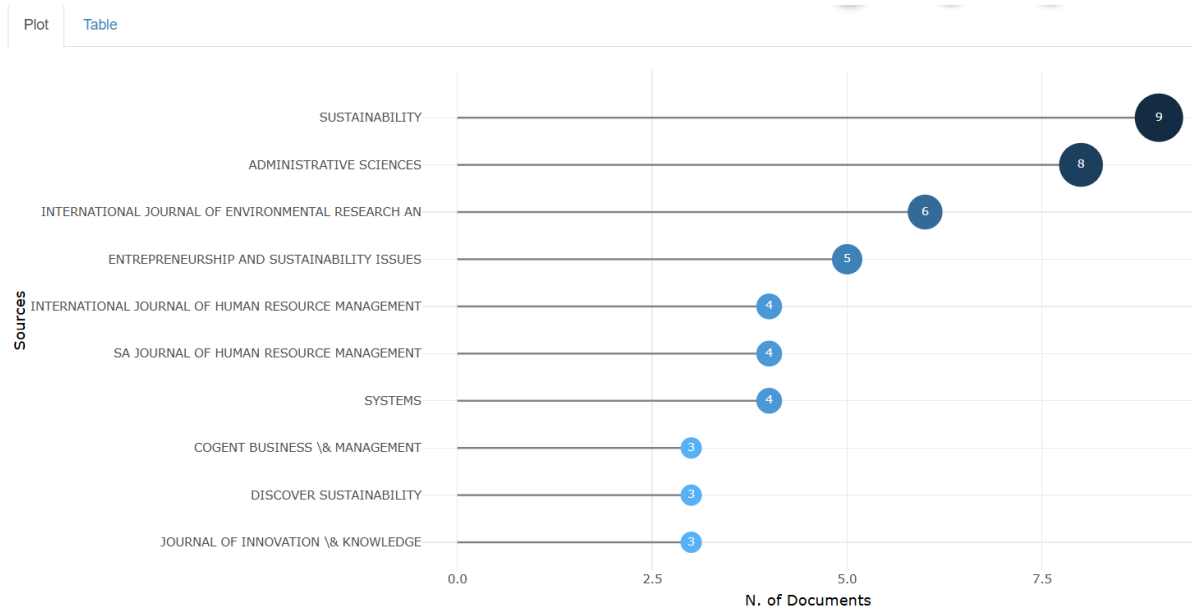


Figure 3. Most Relevant sources

4.3. Authors Production over time

Figure 4 indicates the production of selected authors over time in the field of AI in private-sector HRM. The figure shows that publication activity is distributed across several authors

rather than concentrated in one continuous publication trajectory. Some authors appear over a short period only for example, Acharya U.R. and Faust O. are visible in the early part of the period, while Intezari A. shows a longer span from 2022 to 2025. Others, such as Bhattacharya S., Angelova M., and Bindra S., are active in the later years and extend into 2025, while a few authors such as Malik A. and Budhwar P. appear as more limited single-point contributions. This pattern suggests that the field is still developing through contributions from multiple scholars entering at different moments rather than through a single stable core of repeatedly publishing authors. As Figure 4 indicates, AI-in-HRM research remains open and interdisciplinary, with knowledge production shaped by dispersed author participation and by emerging contributors working across HRM, management, information systems, and governance-related perspectives.

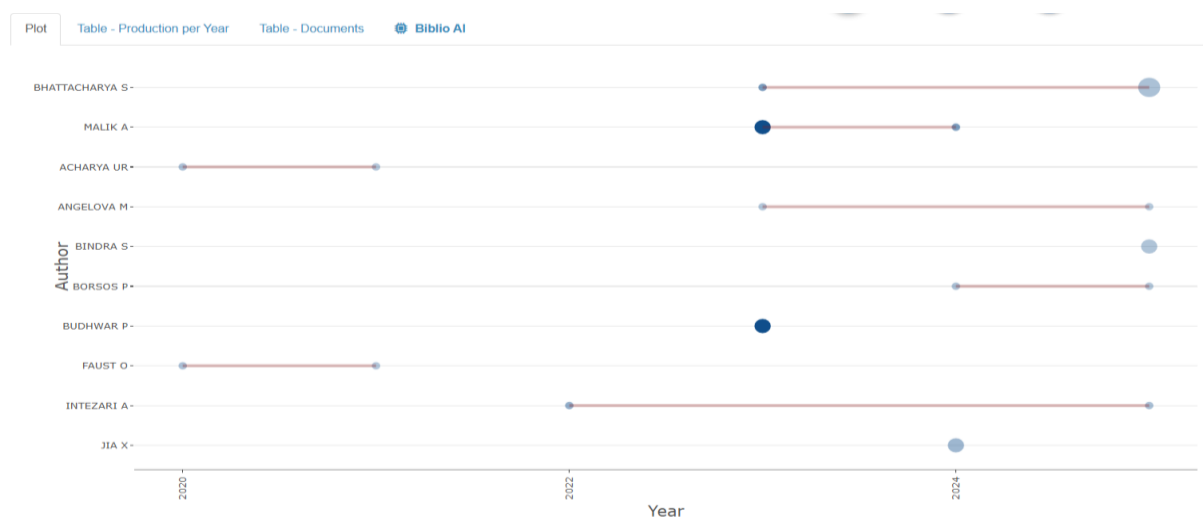


Figure 4. Authors Production over time

4.4. Countries scientific production

Figure 5 reveals the geographical distribution of scientific production on AI in private-sector HRM across countries. The map shows that output is internationally dispersed, but unevenly distributed: The United States appears as the most prominent contributor, while India, the United Kingdom, China, and several European countries also show relatively strong publication activity. A broader second layer of contributions is visible across parts of Europe, Asia, Australia, South Africa, and Brazil, whereas large areas of Africa, Latin America, and parts of the Middle East remain weakly represented or inactive in the mapped dataset. This pattern indicates that research on AI in HRM is global in reach, but still concentrated in a limited group of countries with stronger research infrastructures and greater engagement in digital and

managerial innovation. As Figure 5 suggests, the field is expanding internationally, yet its scientific production remains geographically uneven, which may influence both the visibility of research themes and the contexts from which knowledge on AI in HRM is being produced.

Plot Table

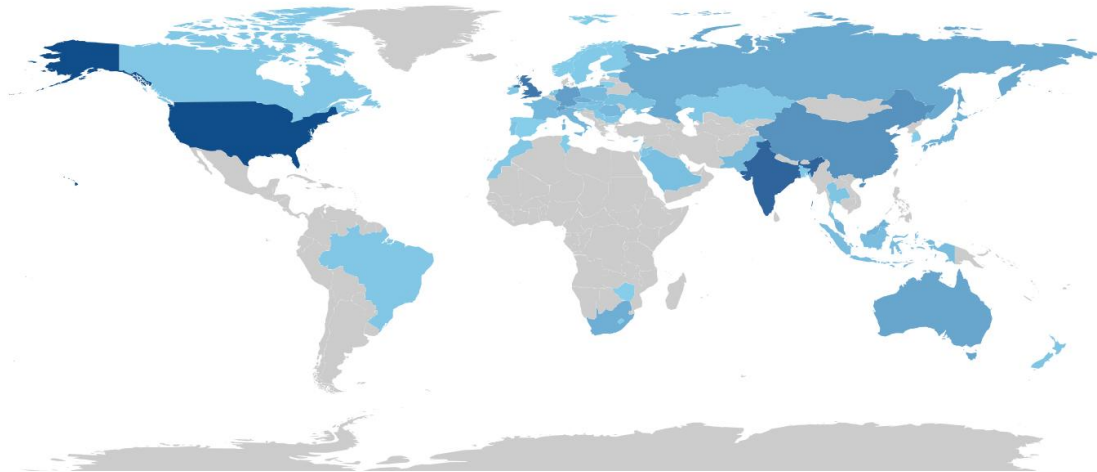


Figure 5. Countries scientific production

4.5. Corresponding Author's Countries

Figure 6 presents the distribution of corresponding-author countries and distinguishes between single-country publications (SCP) and multi-country publications (MCP). The figure shows that India has the highest number of corresponding-authored documents, with a total of about 13, followed by the United Kingdom with around 10 and Germany with about 8. A second group includes the USA, Switzerland, China, and Italy, each contributing roughly 5 to 7 documents, while the remaining countries contribute between 1 and 4. The figure also shows a mixed collaboration profile: some countries display a stronger SCP pattern, while others combine national output with a visible share of MCP publications. This indicates that research on AI in private-sector HRM develops through both nationally rooted research activity and international collaboration. As Figure 6 suggests, corresponding-author leadership is concentrated in a relatively small set of countries, which may influence how themes, methods, and research priorities circulate across the broader field.

4.6. Most cited Countries

Figure 7 demonstrates the most cited countries in the dataset and shows a marked concentration of citation influence in a limited number of national contexts. The United Kingdom ranks first with 531 citations, far ahead of China with 291 and Cyprus with 243. A second group includes

Switzerland (202), Australia (175), and Norway (129), while the remaining countries in the figure Germany (108), Finland (97), the USA (78), and Italy (74) record lower but still visible citation totals. This pattern indicates that the international visibility of the field is more concentrated than its production profile: although several countries contribute to the literature, a smaller group accounts for a disproportionate share of citation impact. As Figure 7 suggests, the intellectual influence of research on AI in private-sector HRM is shaped by a limited set of national research hubs, which may affect which themes, methods, and problem framings become more prominent across the broader field.

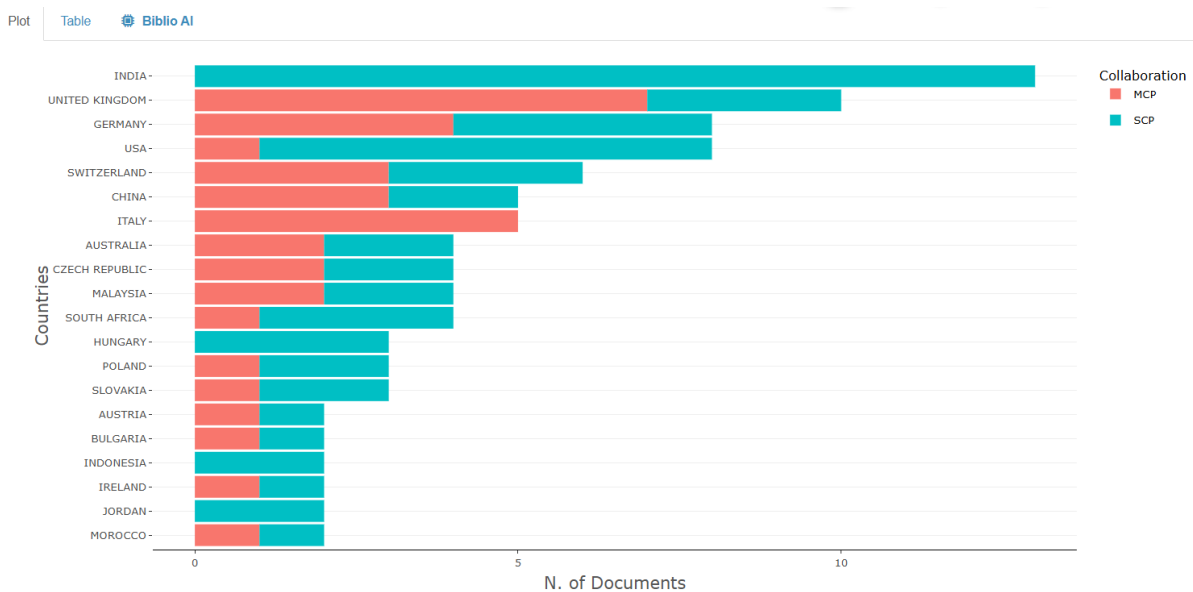


Figure 6. Corresponding Author's Countries

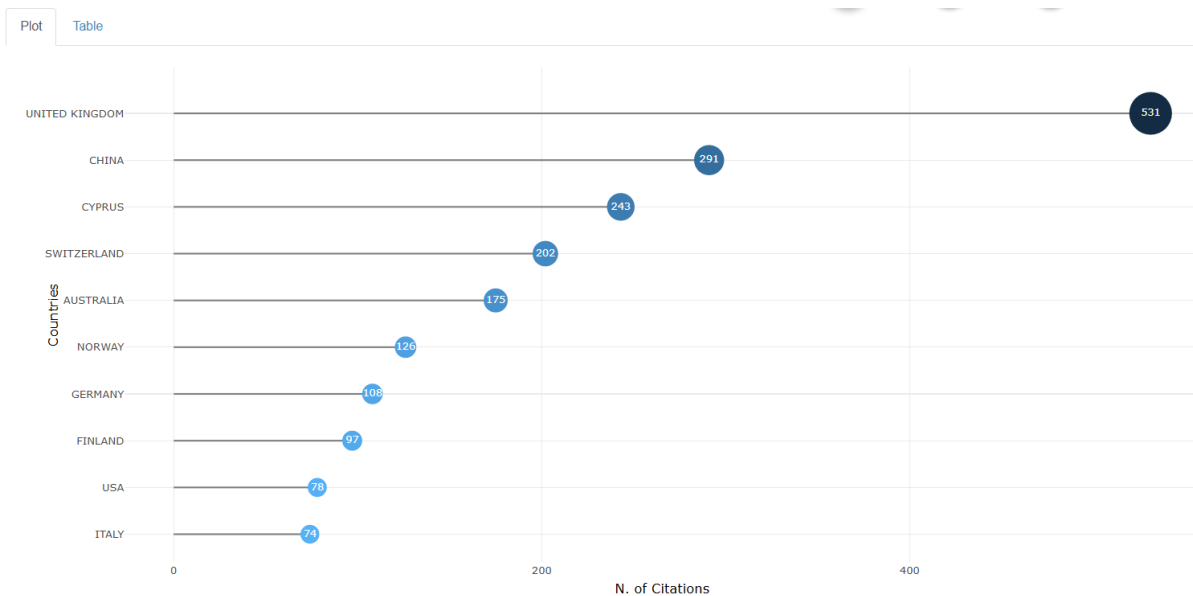


Figure 7. Most cited Countries

4.7. Affiliation production over time

Figure 8 marks the affiliations' production over time and shows that institutional contributions to AI in private-sector HRM are unevenly distributed across the 2020-2025 period. The figure indicates that some affiliations become active early and then stabilize, while others enter later and expand more rapidly. For example, Osaka University and Sheffield Hallam University reach about 6 publications and remain broadly stable across several years, whereas Symbiosis International University rises sharply in the later part of the period and reaches about 9 publications, the highest level shown in the figure. UNIL Lausanne also shows a later increase, reaching around 5 publications by the end of the period, while Aston University and Carnegie Mellon University appear to enter later and then grow to around 5-6 publications. This pattern suggests that institutional participation in the field is expanding through different entry points and rhythms rather than through a single dominant research centre. As Figure 8 indicates, the institutional base of AI-in-HRM research is becoming more visible and diversified over time, which reinforces the interpretation of the field as interdisciplinary and progressively consolidating across multiple organizational research hubs

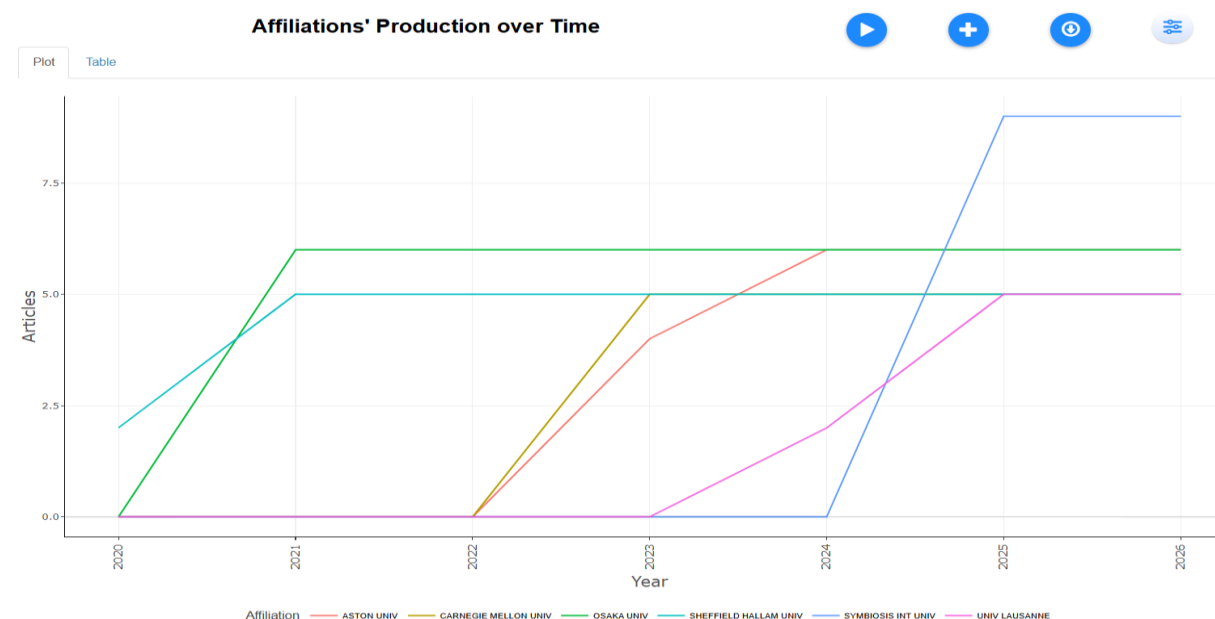


Figure 8. Affiliation production over time

4.8. Words frequency over time

Figure 9 presents the frequency of key terms over time in the AI-in-HRM literature. The figure shows that “artificial intelligence” is by far the most frequently accumulated term, rising from a very low baseline in 2020 to around 60 cumulative occurrences by 2025. A second group of

terms grows more moderately, including “artificial-intelligence” at about 28, “management” at around 20, and “performance,” “recruitment,” “technology,” and “innovation” in a lower but still rising range of roughly 10 to 16 occurrences by the end of the period. This pattern indicates that the literature is consolidating around a stable conceptual core centred on AI and HRM, while also expanding into more specific managerial and operational themes. As Figure 9 illustrates, the growth of terms such as recruitment and performance supports the interpretation that the field is increasingly oriented toward applied HR domains, whereas the persistence of broader terms such as management and technology shows that these applications remain tied to wider organizational and digital transformation debates.

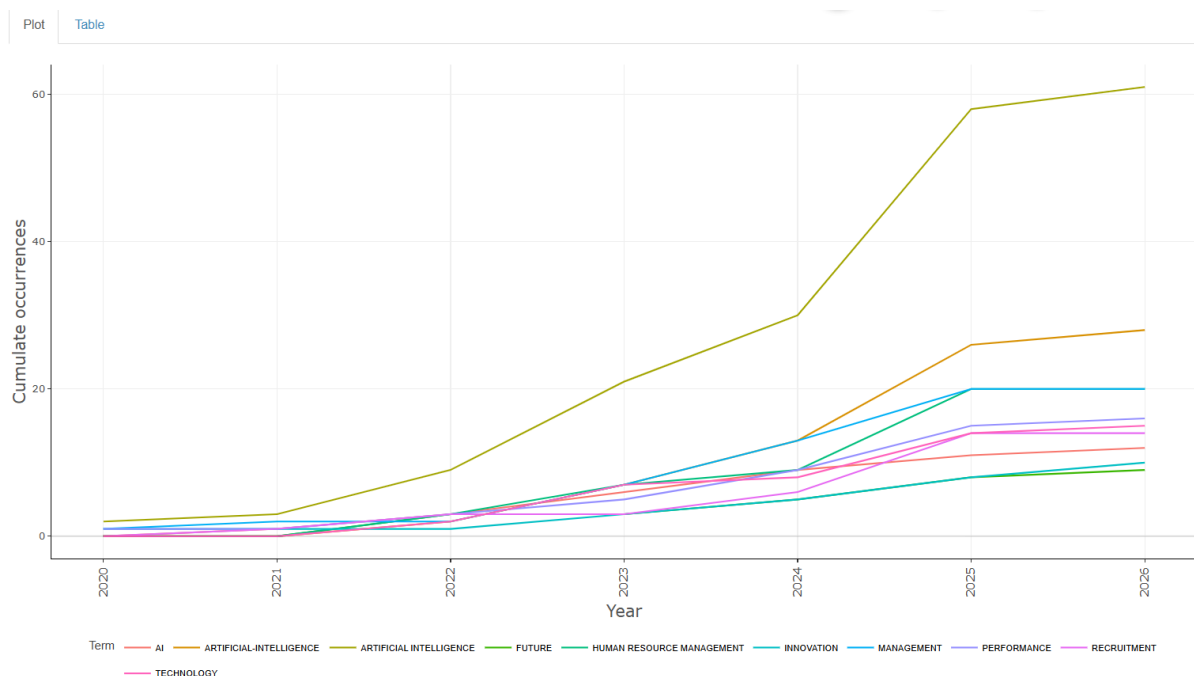


Figure 9. Words frequency over time

4.9. Thematic map

Figure 10 reveals the thematic map of the dataset by positioning keyword clusters according to centrality (relevance to the field) and density (degree of internal development). The figure shows that the cluster “artificial intelligence - recruitment - HR” occupies the basic themes quadrant and appears as one of the largest and most central clusters, indicating that recruitment-related applications form a major organizing core of the literature, although with lower internal density than more specialized themes. A second central cluster around “AI - HRM - adoption” is located close to the middle-right area of the map, confirming that implementation and adoption issues are also prominent in the field. In the motor themes quadrant, the cluster combining “performance - innovation - future” appears both central and comparatively well

developed, suggesting a coherent stream linking AI in HRM to broader organizational transformation and forward-looking performance concerns. By contrast, the upper-left niche themes include a cluster around “human resource management - impact - algorithmic bias”, which is denser but less central, indicating that governance-related discussions are conceptually developed yet less integrated into the mainstream of the field. As Figure 10 illustrates, the literature is structured around a strong core focused on staffing and adoption, while governance and bias-related research remains more specialized, supporting the interpretation that AI-in-HRM scholarship combines central operational concerns with a distinct responsible-AI stream.

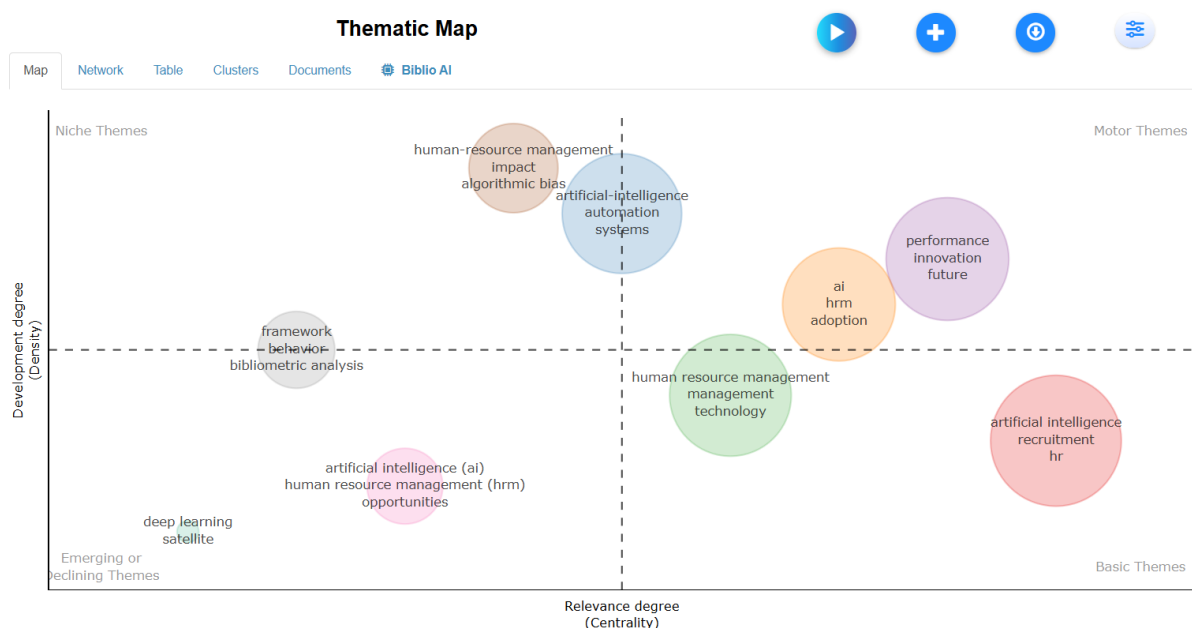


Figure 10. Thematic map

4.10. Trend topics

Figure 11 shows the trend topics in the AI-in-HRM literature over the 2020-2025 period. The figure shows that the most persistent and visible terms are “artificial intelligence,” “human resource management,” “management,” and “performance,” all of which remain active through the later years of the period and extend to 2025. It also shows that more technical terms such as “machine learning” and “big data” enter earlier and remain present across several years, but they do not dominate the field in the same way as the broader AI- and HRM-related terms. This pattern suggests that the literature is consolidating around a stable conceptual vocabulary while progressively attaching that vocabulary to managerial and performance-oriented concerns. As Figure 11 indicates, the field is not characterized by rapid topic turnover; rather, it develops through the sustained visibility of a core set of terms, which helps explain why staffing,

adoption, and performance remain central in the thematic structure, while governance-related concerns appear as more specialized or less recurrent topic labels.

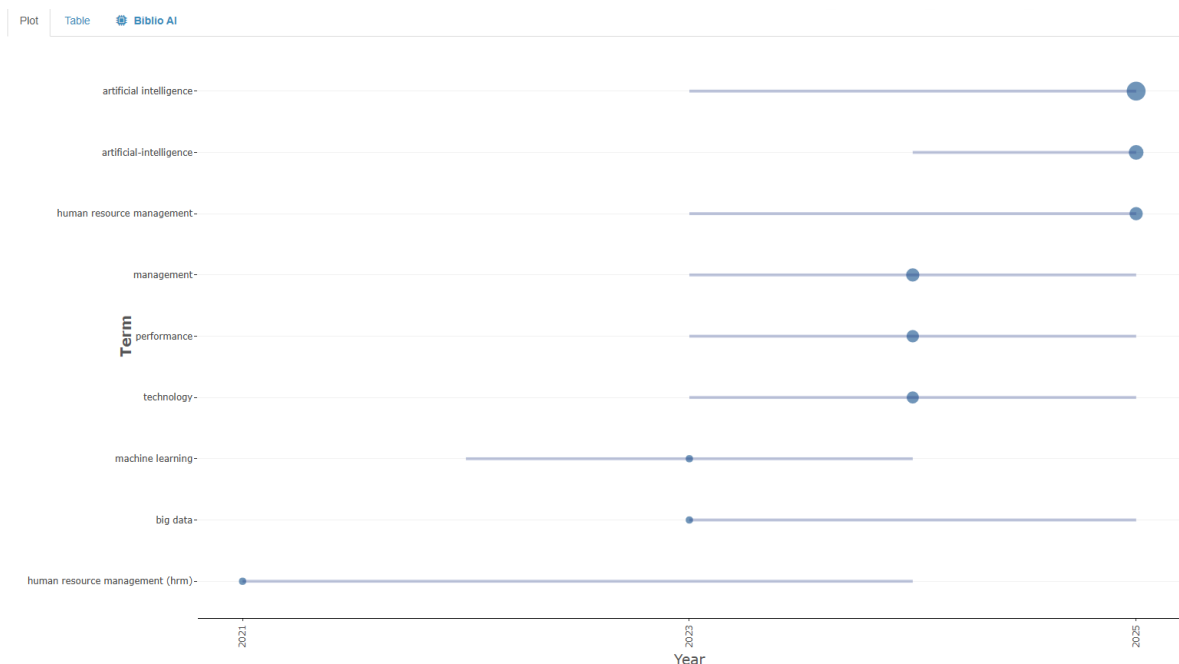


Figure 11. Trend topics

5. Discussion

The results show that research on AI in private-sector HRM has expanded remarkably over the period in study, while still remaining scattered across several scholarly communities. The rise in annual scientific production shows that the topic has moved from a relatively limited area of inquiry to a more visible field of research, which is consistent with the wider use of AI-based tools in HR practice and with growing academic interest in the organizational consequences of algorithmic decision support (Trocin et al., 2021; Prikshat et al., 2023). At the same time, the decline at the end of the series should not be misunderstood, since bibliometric patterns for the most recent year may be affected by indexing delays and incomplete coverage. Taken together, the publication trend, keyword growth, and thematic structure point to continued development of the field rather than decline.

The data extracted explain the current shape of the literature. The presence of HRM journals among the most locally cited sources shows that the field still draws much of its conceptual understanding from established HR scholarship. At the same time, the visibility of management-, systems-, and technology-oriented outlets indicates that AI in HR is also being studied through the lenses of digital transformation, organizational capability, and socio-

technical design (Tinguely et al., 2023; Sharma et al., 2025). This mixed source base helps explain why the literature is both productive and fragmented. Some studies focus on analytics, decision support, and AI-enabled personalization in HR processes (Huang et al., 2023), while others focus more directly on fairness, transparency, accountability, and bias in employment-related decisions (Cai et al., 2024; Soleimani et al., 2025). Therefore, the Data demonstrates a field that shares a common vocabulary but still draws on different research traditions and problem framings.

The thematic map and keyword patterns provide a clearer picture of how the field is organized. Recruitment-related AI appears as one of the most central topics, which is consistent with the fact that staffing is one of the most visible and operationally attractive uses of AI in HR. However, recruitment is not discussed only as a matter of efficiency. It is also closely connected to concerns about fairness and bias, especially when AI is used in screening and selection (Cai et al., 2024; Revillod, 2024). Similarly, the strong position of AI adoption-related themes suggests that researchers are paying considerable attention to how organizations decide to implement AI and under what conditions employees and managers accept it (Tanantong & Wongras, 2024; Kumari et al., 2025). By contrast, the governance-related clusters appear more specialized and less central. This does not mean that they are unimportant. But, it suggests that responsible-AI debates are developing separately from the main application-oriented discussions, even though in practice the two are closely linked (Tinguely et al., 2023; Soleimani et al., 2021).

The keyword dynamics reinforce this interpretation. Terms related to artificial intelligence, human resource management, recruitment, and performance remain visible across the period, which suggests a stable conceptual core. At the same time, the prominence of management- and innovation-related vocabulary shows that AI in HR is often discussed as part of broader organizational change rather than as a narrow technical tool (Trocin et al., 2021). This is essential for translating the findings. The data do not show two fully separate and opposing research camps. Instead, it shows that the literature is increasingly organized around two recurring lines of inquiry: one focused on the use of AI to improve HR processes, especially recruitment and performance-related decision-making, and another focused on governance questions such as fairness, bias, transparency, accountability, and privacy. These two lines are related, but they are not yet fully integrated in the literature.

This result matters because the research domain often presents efficiency and governance as opposite necessities, whereas organizations must deal with both at the same time. In practice, AI in HR cannot be implemented only on the basis of speed, consistency, or predictive capacity. In high-stakes HR decisions, organizations also need to explain how the system works, justify the decision, and address the concerns of candidates, employees, and managers. This is especially clear in recruitment and performance-related contexts, where decisions have direct consequences for careers and opportunities (Baydili & Tasci, 2025; Tinguely et al., 2023). The results therefore do not simply show a tension in the abstract. They suggest that research has not yet fully connected operational adoption with the governance conditions that make such adoption acceptable and sustainable.

The geographic and institutional results point in the same direction. The field is global, but unevenly distributed. Some countries and institutions are more visible than others in terms of both production and citation, which suggests that agenda-setting power is concentrated in a limited number of research hubs. This matters because research on AI in HR is shaped by institutional environments, regulatory conditions, and access to organizational data. If the most visible contributions come from a narrower set of contexts, then the literature may not fully reflect how privacy, legitimacy, and fairness are understood across different settings (Poisat et al., 2024; Revillod, 2025; Soleimani et al., 2025). Similarly, the staggered production of authors and affiliations suggests that the field is still consolidating and continues to attract scholars from different backgrounds, including HRM, management, information systems, and ethics-related research. This broad participation is valuable, but it also increases the need for more explicit conceptual integration (Bou Zakhem et al., 2025; Koteczki et al., 2025; Tinguely et al., 2023; Huang et al., 2023; Malin et al., 2023; Revillod, 2025).

These findings point to a clear set of directions for future work and development. First, the central place of recruitment in the literature suggests that future studies should connect adoption models more directly to fairness and bias mitigation, rather than treating responsible AI as a secondary issue (Revillod, 2024; Soleimani et al., 2025). Second, the expanding role of AI in shaping employee experience raises important questions about how an employee faces technologies and it affects trust dynamics and privacy expectations within organizations and longer-term employment relationships (Malik et al., 2022; Poisat et al., 2024). Third, the presence of sustainability-oriented outlets and themes demonstrates that future studies should examine more closely when AI supports responsible and sustainable HR practices and when it

instead strengthens monitoring or reinforces inequality (Anjani, 2025; Housheya & Atikbay, 2025). Finally, the appearance of generative AI in the literature points to the need for new evaluative and governance frameworks for HR systems that do more than predict: they also interact with users and generate content, which makes questions of reliability and accountability even more important (Bou Zakhem et al., 2025; Koteczki et al., 2025).

The study also has limitations that should be kept in mind. The dataset was built through sequential filtering, including disciplinary restrictions and an open-access condition. These choices helped maintain transparency and coherence by limiting the dataset to these categories, the analysis remained centred on research that addresses HR practices such as recruitment, talent management, performance evaluation, employee experience, and governance from a management and social science perspective. In addition, citation patterns reflect visibility within the selected corpus and are affected by publication timing and indexing practices. For that reason, the results should be read as a structured map of the selected literature rather than as a complete representation of all research on AI and employment. Even with these limits, the study provides a useful overview of how AI in private-sector HRM is being studied and where stronger connections are still needed between operational research and governance-oriented scholarship.

6. Conclusion

This study set out to answer two questions: how scientific production on AI in HRM has evolved since 2020, and what thematic clusters and trending topics structure the literature in private-sector contexts. In relation to RQ1, the bibliometric results show a clear increase in publication activity over the period, which supports H1 and indicates the gradual development and consolidation of the field. Research on AI in HRM has moved from a limited area of inquiry to a more visible and structured domain of study.

In relation to RQ2, the results show that the literature is mainly organized around a central group of operational HR topics, especially recruitment, talent acquisition, and performance-related decision-making, while governance issues such as fairness, bias, transparency, accountability, and privacy form a distinct and more specialized thematic area. In this sense, the findings support H2, although the results suggest differentiation within the field more clearly than a complete separation between themes.

In summary, the study provides a bibliometric overview of global research on AI in private-sector HRM during 2020-2025 and clarifies the main lines of development within the field. Within the limits of the dataset and filtering choices, the results suggest that future research should examine more closely how governance-related concerns become integrated into mainstream research on recruitment and performance management, and whether this relationship changes across different institutional and national contexts.

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