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Artificial Intelligence in Human Resource Management: A Bibliometric Analysis Comparing Pre- and Post-COVID-19 Literature

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A B S T R A C T

Existing research on AI applications in HRM has focused on specific functions with limited exploration of other areas. Changes in publication trends and focuses coinciding with COVID-19 require investigation. Study conducted a bibliometric analysis of 233 publications from 2015-2024 in the Scopus database, analyzing trends in sources, authorship, institutions, countries, keywords and themes. The results show an exponential surge in the annual number of publications since 2020, indicating that COVID-19 accelerated interest in AI-driven workforce innovations. Research efforts became more concentrated among prolific authors, core journals, and leading universities. Study reveals how the pandemic triggered substantive changes, transforming AI-HRM research into a more globally engaged and focused field. This is the first comprehensive bibliometric study to analyze how COVID-19 transformed AI-HRM research landscape in terms of quantitative trends, participants and investigated topics.

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INTRODUCTION

Artificial Intelligence (AI) in Human Resource Management (HRM) refers to the application of AI technologies to streamline and enhance various HR functions (Nawaz, Arunachalam, Pathi, & Gajenderan, 2024; Alsaif & Aksoy, 2023). These technologies, including machine learning, natural language processing, and data analytics, automate repetitive tasks, improve decision-making processes, and enhance the overall employee experience. The advent of Artificial Intelligence (AI) has heralded a new era of technological innovation, profoundly influencing a myriad of industries, including Human Resource Management (Mer, 2023). AI in HRM, often referred to as AIHRM, encompasses the application of advanced technologies such as machine learning, natural language processing, and data analytics to streamline and enhance various HR functions (Bhise, Karekar, Nikam, & Ray, 2024). These technologies have the potential to revolutionize traditional HR practices, making them more efficient, accurate, and strategically impactful. In today's competitive business environment, organizations are increasingly recognizing the need to leverage AI to maintain an edge (Omol, 2023; Oosthuizen, 2022). AIHRM promises to automate repetitive and administrative tasks, thus freeing HR professionals to focus on strategic initiatives that drive organizational growth. From recruitment and talent acquisition to employee onboarding, performance management, and learning and development, AIHRM offers a comprehensive suite of tools that can transform how HR departments operate (Nishar, 2022).

Various research studies have been conducted in the field of Artificial Intelligence in Human Resource Management (AIHRM), employing methodologies such as systematic reviews and bibliometric analyses to provide comprehensive insights into the domain. Systematic reviews meticulously compile and evaluate existing literature to assess the effectiveness and implications of AI technologies across different HR functions (Mer, 2023; Ali, et al., 2023). For instance, systematic reviews have revealed how AI-driven tools enhance recruitment processes by reducing time-to-hire and improving candidate-job matches, yet they also highlight challenges such as algorithmic bias and the need for transparency (Albaroudi, Mansouri, & Alameer, 2024). Similarly, reviews in performance management have demonstrated how AI can offer real-time feedback and predictive analytics to optimize employee performance, while studies on employee engagement have shown AI's potential to personalize experiences and predict attrition risks (Madanchian, Taherdoost, & Mohamed, 2023). Complementing these reviews, bibliometric analyses quantitatively map the research landscape, identifying publication trends, influential studies, and key areas of focus. These analyses have shown a significant increase in AIHRM research, with notable contributions from interdisciplinary collaborations and a growing global interest, particularly from North America, Europe, and Asia. Together, these systematic reviews and bibliometric analyses provide a robust framework for understanding the current state and future directions of AIHRM, offering valuable insights for HR

professionals, business leaders, and researchers (Bonilla-Chaves & Palos-Sánchez, 2023).

Complementing these reviews, bibliometric analyses quantitatively map the research landscape, identifying publication trends, influential studies, and key areas of focus (Mhlanga & Dzingirai, 2024). The importance of bibliometric analysis is particularly pronounced when comparing data from before and after the COVID-19 pandemic. Pre-COVID-19, bibliometric analyses were essential for charting the steady growth of AIHRM research, identifying nascent trends, and understanding the theoretical benefits and pilot implementations of AI in HR (Karbasi, Gohari, & Sabahi, 2023). However, the onset of COVID-19 drastically altered the landscape, accelerating the need for digital and remote solutions. Post-COVID, bibliometric analyses became critical for capturing the exponential increase in AIHRM research and real-world applications, driven by the urgent need to manage remote workforces and sustain employee engagement (Kişi, 2023). These analyses have shown a significant increase in AIHRM research, with notable contributions from interdisciplinary collaborations and a growing global interest, particularly from North America, Europe, and Asia.

Together, these bibliometric analyses provide a robust framework for understanding the current state and future directions of AIHRM, offering valuable insights for HR professionals, business leaders, and researchers. This article aims to investigate the transformation of AI-HRM research due to the COVID-19 pandemic, focusing on changes in publication trends, relevant sources, authorship patterns, institutional affiliations, countries' production over time, most cited countries, trending topics, frequency of key terms, and thematic evolution.

LITERATURE REVIEW

Bibliometric analyses provide quantitative insights into the research landscape by examining publication patterns, citation networks, and research collaborations. Several bibliometric studies have been conducted to map the development and impact of AIHRM research.

Researchers obtained 298 papers from the Scopus database with the aim of identifying research that remains relevant to the theme of AI in HRM. Their analysis revealed that the primary research focus in this field is still relatively limited, despite the significant impact that artificial intelligence practices can have on human resources (Wijaya & Qamari, 2024). The bibliometric analysis of 157 articles downloaded from the Scopus database enabled us to trace the contours of an emerging global community of studies on this phenomenon. Results Five main clusters of most-debatable topics have been singled out and show that AI has already been incorporated into a lot of the many-splendored functions and processes of HRM. However, the evident prevalence of research into the algorithm-based applications for recruitment and selection processes stands out. Anthropomorphic forms of task-automation are in the frontline of AI applications as far as the context of HRM is concerned (Za, Lazazzara, Shaba, & Scornavacca, 2024).

A dataset of 247 Scopus-indexed publications from the earliest available date, 1993 to 2020 to understand the key theme and the concerned research focus. The key themes which have subscribed to the development of this literature called. The outcome in terms of the Co-occurrence analysis put forward that the majority of the research related AI in HRM is focused on Resource allocation, talent Acquisition, and training and development. The research identifies significant AI-attributed areas in human resource functions that need further research (Kaur, AG, AG, & Gandolfi, 2023). Another study with a total of 67 articles from the Scopus database from the year 2015-2022 were collected to identify ten research clusters such as, 1st multi-agent system; 2nd decision support system; 3rd internet of things; 4th active learning; 5th decision tree; 6th optimisation; 7th software design; 8th data mining; 9th cloud computing and; 10th human-robot interaction (Mathushan, Gamage, & Wachissara, 2023).

Palos-Sánchez, Baena-Luna, Badicu, and Infante-Moro (2022) conducted a bibliometric analysis using Web of Science and Scopus databases, initially identifying 156 articles, of which 73 were selected for detailed examination. Their findings indicate that AI in HRM is a burgeoning field showing continuous growth and a promising future. However, the research predominantly centres on AI applications in recruitment and selection, while other potential areas for AI integration remain largely unexplored. The study "Role of Big Data in Human Resource Management: A Review and Bibliometric Analysis" identifies seven distinct clusters. The cluster analysis underscores the key topics of interest for both current and future researchers in the fields of HRM and AI. The emerging clusters are as follows: 1st focuses on the adoption of HR analytics; 2nd on decision support systems; 3rd on dynamic capabilities; 4th on digital innovation; 5th on organizational ambidexterity; 6th on the Internet of Things; and 7th on cloud computing (Mathushan, Gamage, & Thero, 2022).

This study integrates Socio-Technical Systems Theory to explore how AI in HRM blends technological capabilities with human-cantered practices for organizational effectiveness and employee satisfaction. Additionally, it employs Innovation Diffusion Theory to analyse how AI adoption spreads within HRM, emphasizing factors like perceived benefits, compatibility with existing systems, complexity, trialability, and observability to facilitate successful implementation and acceptance.

The existing research on AI-HRM integration is primarily focused on specific HR functions, such as recruitment and selection, while other potential areas for AI integration remain largely unexplored. Additionally, there is a need to better understand the balance between technical (data-driven) and managerial (human-centric) components of talent-focused human resource information systems (T-HRIS) in the context of AI-HRM integration. The research on AI-HRM integration has been predominantly published in Information Systems and Management journals, suggesting potential blind spots in other publication venues that need to be investigated. Furthermore, the impact of the COVID-19 pandemic on the transformation of AI-HRM research,

in terms of publication trends, relevant sources, authorship patterns, institutional affiliations, countries' production, and most cited countries, trending topics, frequency of key terms, and thematic evolution, is not well understood and requires further exploration. To address these gaps, a comprehensive bibliometric and thematic analysis is needed to uncover the evolution and emerging trends in the AI-HRM research field.

METHODOLOGY

Research Design

This study employs a systematic literature review combined with quantitative methods to investigate the application of artificial intelligence (AI) in human resource management (HRM) from 2015 to June 5, 2024.

Data Sources

The Scopus database was selected as the primary source for data collection due to its comprehensive coverage of high-quality academic journals and conference proceedings. This database was chosen for its extensive repository, which ensures a broad and diverse collection of relevant literature.

Data Extraction

The extraction process focused on identifying publications that explicitly discuss artificial intelligence in the context of human resource management. The following criteria were applied during the data extraction process:

Keywords: The search was conducted using the following keywords: "Artificial Intelligence," "Human Resource Management," "Human," and "Humans." The Boolean operator "AND" was used to combine these keywords to ensure that the search results included articles that addressed the intersection of AI and HRM.

Language: Only articles published in English were included in the study to maintain consistency and ensure the comprehensibility of the analysis.

Subject Area: The search was confined to the subject area of Business, Management, and Accounting to focus specifically on the application of AI within the context of HRM.

Type of Publications: The study covered only journal articles and conference proceedings to ensure the inclusion of peer-reviewed and high-quality research outputs.

Data Analysis

The analysis of the extracted data was conducted using bibliometric methods, facilitated by the R software packages. Bibliometric analysis allows for a quantitative assessment of the literature, including the identification of publication trends, key themes, influential authors, and collaborative networks.

Software Tools: The R programming language, known for its robust statistical and graphical capabilities, was utilized for data analysis. Specifically, the bibliometrix package within R was employed to perform the bibliometric analysis.

Interactive Visualizations: The Biblioshiny application, an interactive web interface for bibliometrix, was used to provide visual representations of the data. This tool enabled the creation of interactive and insightful visualizations, such as co-citation networks, keyword co-occurrence maps, and publication trend charts.

Procedure

Search and Data Collection: A comprehensive search was conducted in the Scopus database using the specified keywords and criteria. The search results were filtered to include only relevant articles published in English within the specified subject area and publication types. A total of 233 documents were identified for inclusion in the analysis.

Data Cleaning and Preparation: Duplicate entries were removed. The remaining articles were reviewed to ensure relevance and adherence to the inclusion criteria.

Bibliometric Analysis: The cleaned dataset was imported into R. Using the bibliometrix package, various bibliometric analyses were performed, including trend analysis, co-authorship networks, and thematic mapping. Biblioshiny was used to generate interactive visualizations to aid in the interpretation and presentation of the findings. The data was analyzed in three distinct time periods to compare results before and after the COVID-19 pandemic: from 2015-2019 and from 2020-2024. Additionally, the entire dataset spanning from 2015 to 2024 was analyzed as a whole.

RESEARCH RESULT

This section displays the results of publication trends, relevant sources, authorship patterns, institutional affiliations, and countries' production over time, focusing on the shift before and after COVID-19 in AI_HRM. It highlights the most cited countries and trending topics, along with the frequency of key terms and thematic evolution. The analysis reveals significant changes in research dynamics, with notable increases in collaborative efforts and interdisciplinary studies. Additionally, it underscores the rise in publications from emerging economies and the evolving focus on remote work and digital transformation.

Annual Scientific Production of AI-HRM Scientific Paper

The figure shows the production quantity of annual scientific papers about AIHRM between 2015 and 2024.

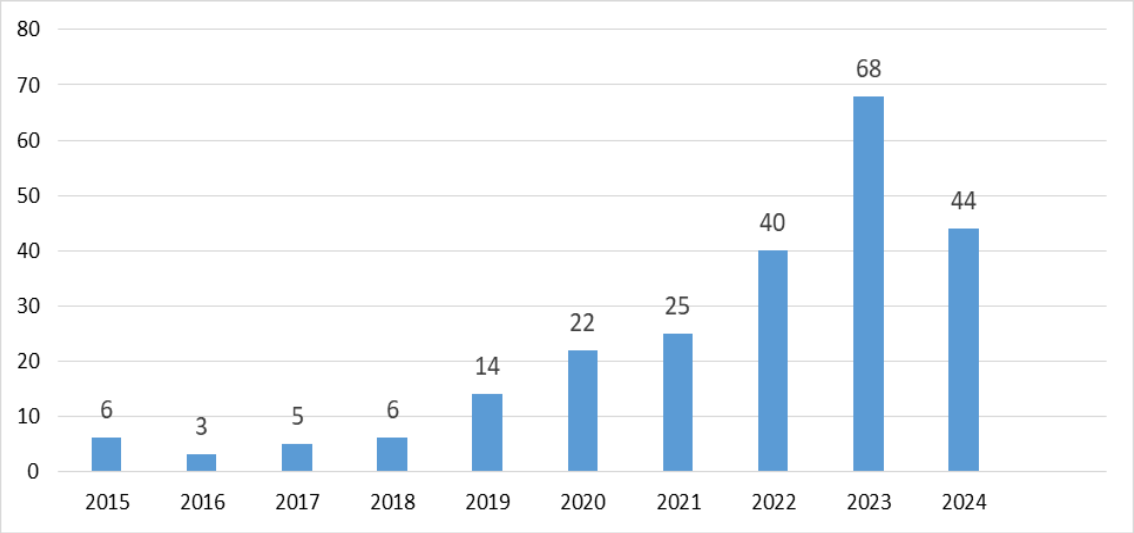

Figure 1: Publication Trend

During the years prior to the COVID-19 pandemic, the number of published articles per year was relatively consistent, having averaged around 7 articles per year from 2015 to 2019. There started to be a more notable increase in production beginning in 2020. This later increased exponentially in the following years to reach their highest output in 2023 with 68 articles. The surge in publications since COVID-19 indicates a remarkable rise in research interest in, and activities related to, AIHRM, with a probable push due to the pandemic accelerating digital transformation and workforce management.

Most Relevant Source

The figure illustrates the most relevant sources and applies Bradford's Law to AIHRM research before and after COVID-19. It shows a diversification of journals and conferences contributing to the field post-pandemic. It also highlights a concentration of key publications in a few core journals, with a broader range of sources emerging post-pandemic.

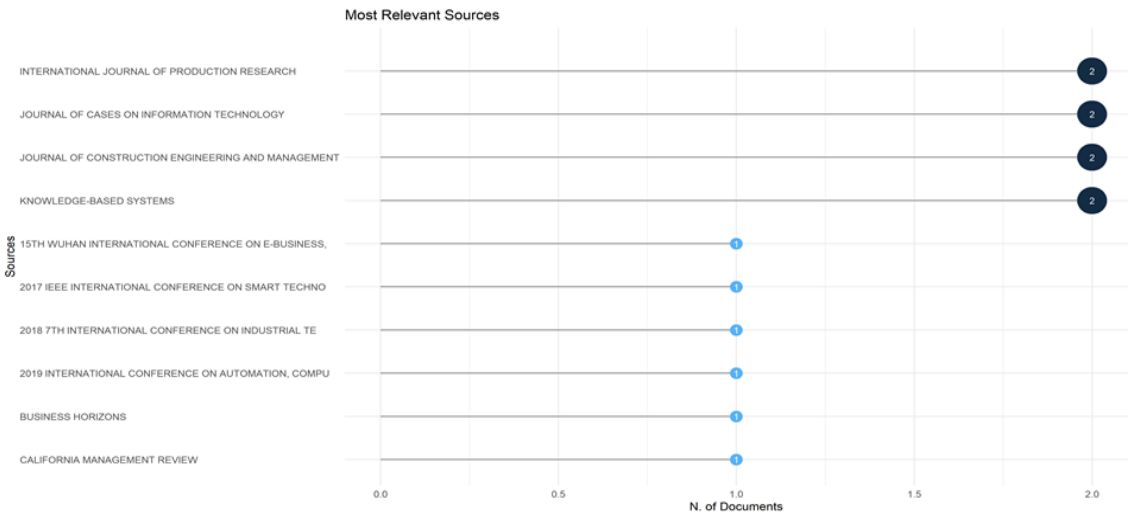

Figure 2: Most relevant source before covid-19

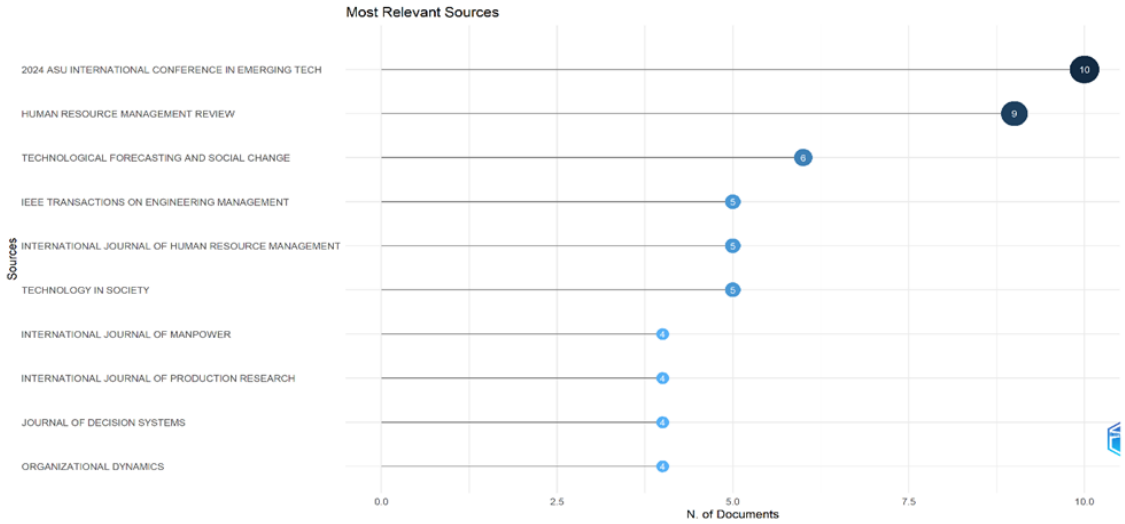

Figure 3: Most relevant source after covid-19

Before the COVID-19, the majority of the publication related to AIHRM was scattered across several niche journals and conference proceedings related to production research, information technology cases, construction engineering, and knowledge-based systems. Most sources had 1-2 articles per year, which indicates facts that the publications are coming from a very well-diversified collection of sources. In contrast, post-COVID-19, there is a visible fact that more targeted and prominent journals like the Human Resource Management Review, Technological Forecasting and Social Change, and IEEE Transactions on Engineering Management collectively accounted for higher numbers of publications per source, that is a concentration in already well-established academic platforms of AIHRM.

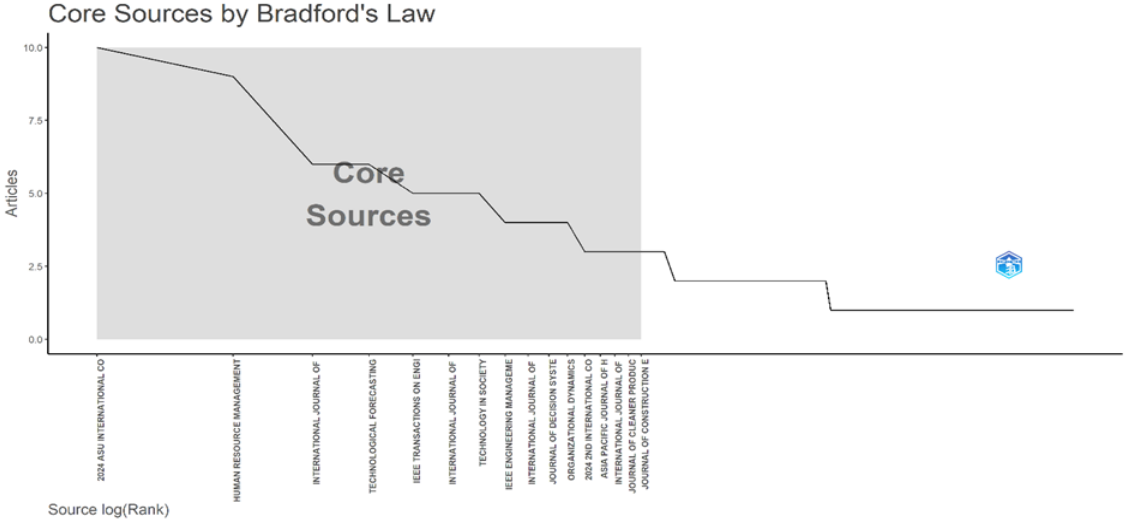

Figure 4: Bradford'd Law

Bradford's Law helps to identify the most productive journals in a given field by categorizing journals into a core group and several succeeding groups based on their article contributions. The given data ranks sources by the number of articles they published, showing that the "2024 ASU International Conference" and "Human Resource Management Review" are the most

productive. The cumulative frequency column demonstrates the total number of articles up to each rank, indicating that few journals contribute the majority of articles, while many contribute fewer. This distribution is skewed, with productivity decreasing as rank increases. By dividing the journals into zones with equal article contributions, Bradford's Law provides a framework to identify core journals and understand research dissemination patterns in a specific field.

Most Relevant Authors

The figure displays the most relevant authors in AIHRM research, analyzed using Lotka's Law, comparing data from before and after COVID-19. It shows a core group of prolific authors dominating the field, with a notable increase in contributing researchers post-pandemic. This suggests a surge in academic interest and wider collaboration in AIHRM following COVID-19.

Pre-pandemic, contributions are much more spread out with each author like ADUAMOAH M., AGGARWAL V, BOCQUET J-C making one article contribution. This shows wider and less concentrated research effort wherein there wasn't any dominant figure or concentrated expertise. Post-pandemic, one finds this field consolidated the research effort with a few authors emerging as leading contributors. Notably, MALIK A published five, LI Y four, and several others, such as BUDHWAR P and CHOWDHURY S, each publishing three papers.

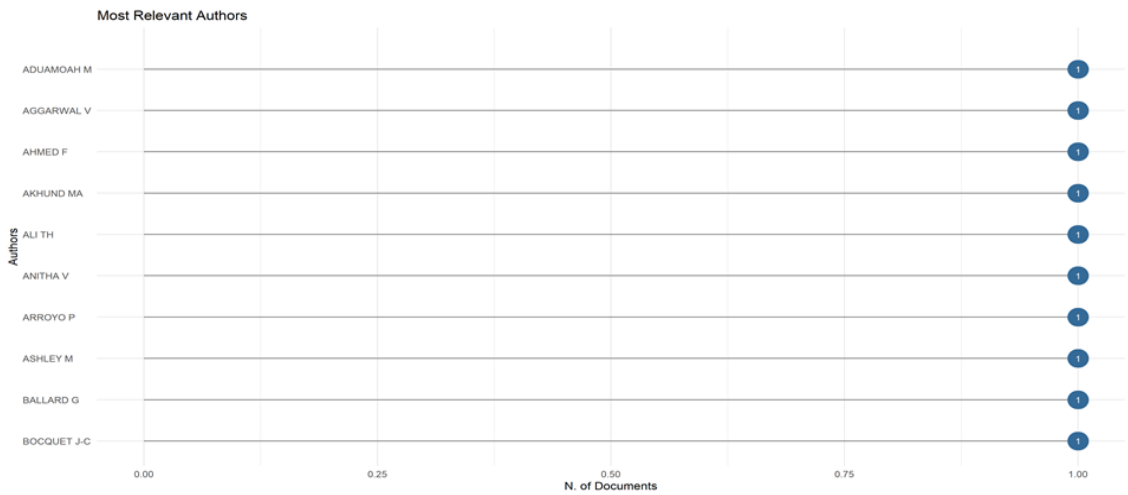

Figure 5: Most relevant authors before covid-19

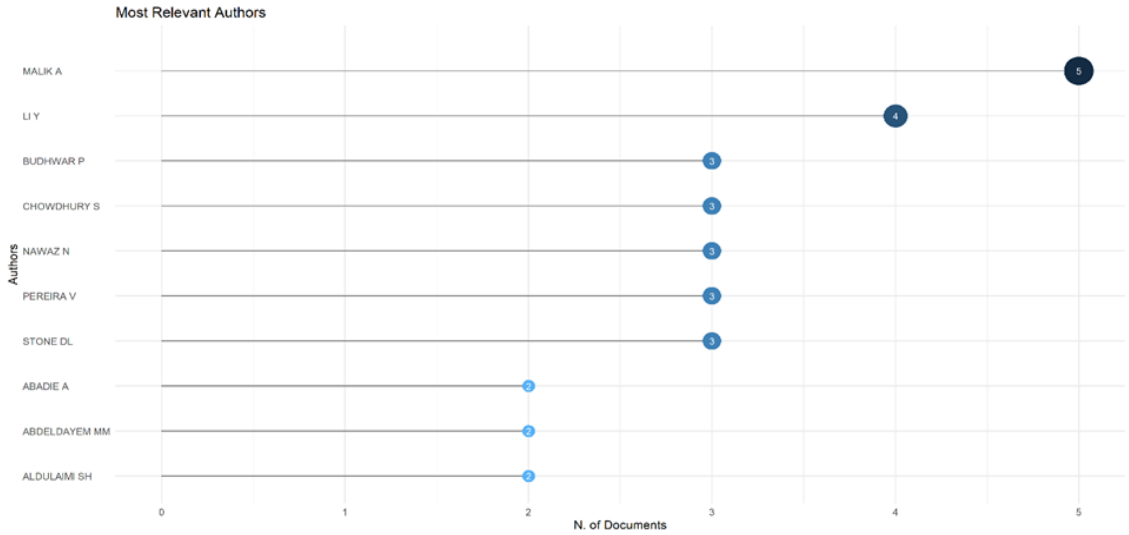

Figure 6: Most relevant authors after covid-19

This indicates a gradual shift towards more concentrated and intensified research efforts. Perhaps, this development was set off by the increasing relevance of AIHRM in the context of working from home, digital transformation, and new workforce challenges precipitated by the pandemic. The post-pandemic data reflects a maturation of the field with key researchers establishing themselves as central figures, driving forward more concentrated and prolific research agendas.

Lotka's Law describes the frequency distribution of scientific productivity, suggesting that the number of authors contributing a specific number of articles is inversely proportional to the square of the number of articles written. The provided data exemplifies this principle in the context of AIHRM research. It shows that a vast majority of authors (702) wrote only one document, accounting for 94.2% of the total authors.

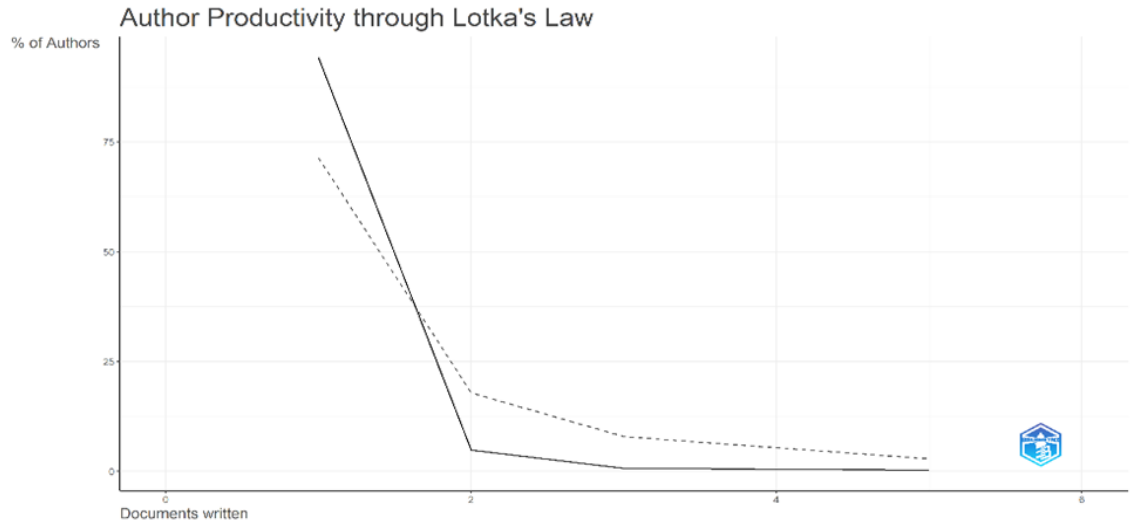

Figure 7: Lotka's Law

This high proportion reflects Lotka's observation that most researchers contribute only a single publication. As the number of documents authored increases, the number of authors sharply decreases: 36 authors (4.8%) wrote two documents, five authors (0.7%) wrote three documents, and only two authors (0.3%) authored five documents. This pattern underscores the exponential decline in author frequency with an increase in the number of contributions, illustrating that prolific authors are rare, while the bulk of contributions come from those who publish less frequently.

Most Relevant Affiliation

The figure shows the most relevant affiliations in AIHRM research, comparing data from before and after COVID-19. It indicates a shift in leading institutions, with a rise in contributions from a more diverse range of universities and research centres post-pandemic. This trend reflects increased global collaboration and investment in AIHRM research following the impact of COVID-19.

Before the pandemic, the most active institutions included the University of Salerno with five articles, followed by Hohai University and Università degli Studi di Napoli Federico II, each with four articles. Other notable contributors included Chatenay-Malabry and Hefei University of Technology, with three articles each. The contributions were spread across a diverse range of global institutions, with many universities contributing only a few articles.

After the pandemic, there is a notable increase in research output from specific institutions. Aston University emerged as the leading contributor with ten articles, indicating a significant focus on AIHRM research. Poznan University of Technology followed with six articles, while several other universities, including Huazhong University of Science and Technology, Jiangsu University, NEOMA Business School, and the University of Nicosia, each contributed five articles.

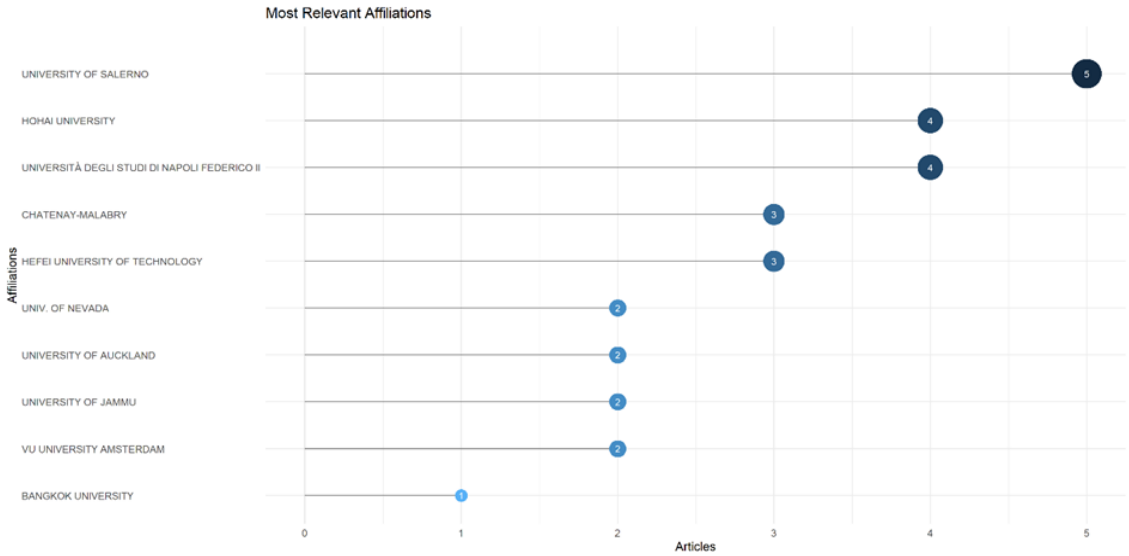

Figure 8: Most relevant affiliation before covid-19

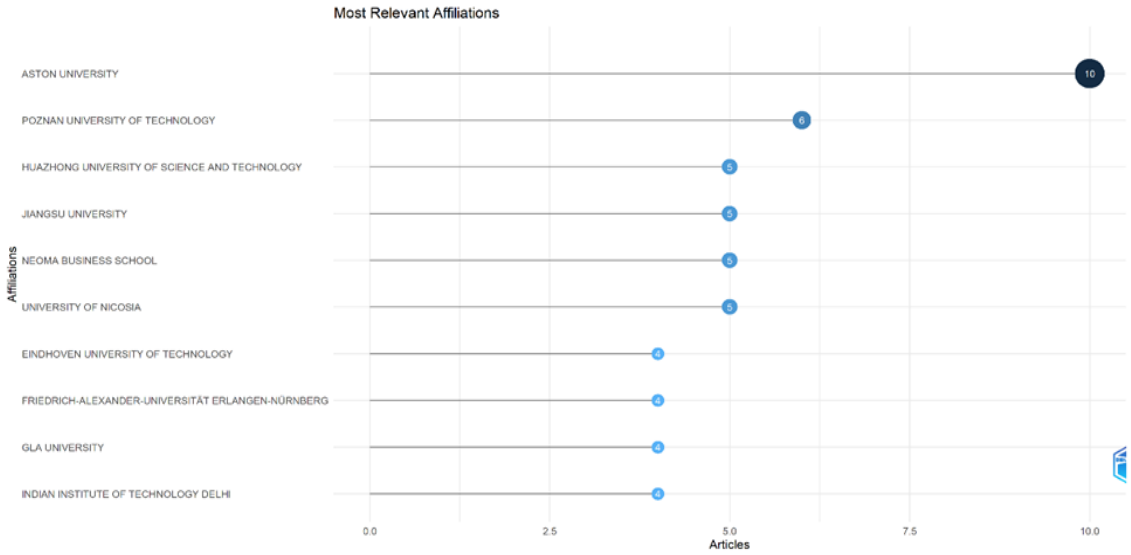

Figure 9: Most relevant affiliation after covid-19

This post-pandemic period shows a more concentrated research effort with fewer institutions dominating the field. Additionally, new prominent contributors such as Eindhoven University of Technology and Indian Institute of Technology Delhi, each with four articles, highlight a shift in geographical and institutional focus.

Overall, the pandemic appears to have catalyzed more focused and intensified research efforts in AIHRM, with certain institutions emerging as key players in the field. This shift reflects broader trends in the academic response to the pandemic, where specific universities have ramped up their research activities to address new challenges and opportunities in human resource management through artificial intelligence.

Country Production over Time

The figure illustrates country production in AIHRM research over time, comparing periods before and after COVID-19. It shows a significant increase in research output from various countries post-pandemic, with notable contributions from both established and emerging economies. This trend highlights the global surge in interest and investment in AIHRM, driven by the pandemic's impact on digital transformation and workforce management.

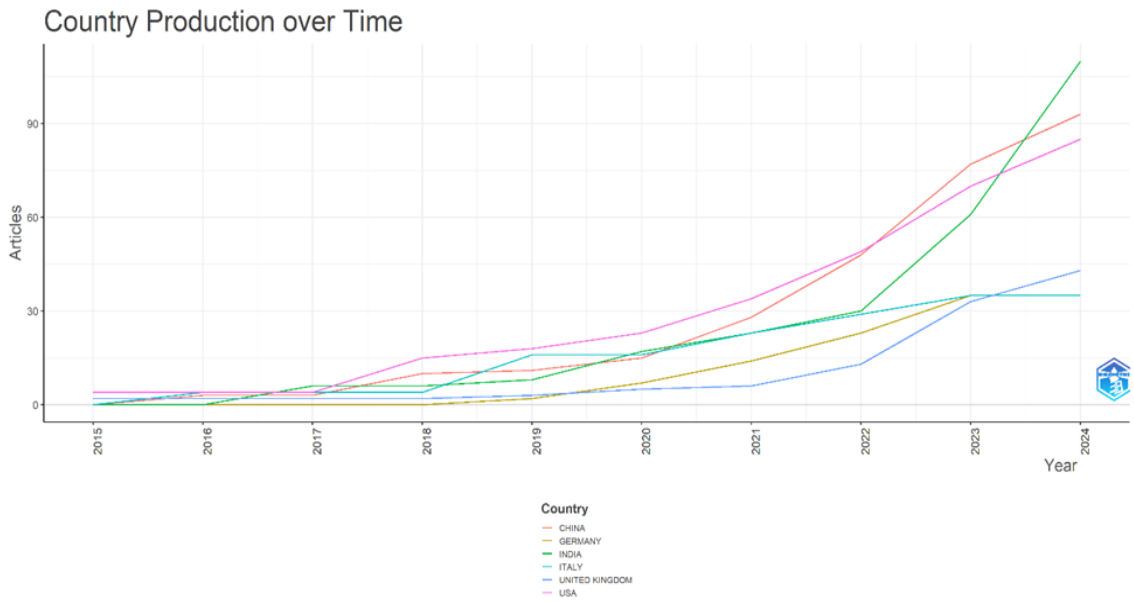

Figure 10: Country production over time

Before the pandemic (2015-2019), the United States led the field with a steady increase in articles, starting with 4 articles per year in 2015 and reaching 18 articles by 2019. The United Kingdom showed modest growth, with 2 articles per year until 2018, slightly increasing to 3 articles in 2019. China and Italy also exhibited gradual increases, with China starting at zero articles in 2015 and reaching 11 articles in 2019, while Italy's contributions increased from zero in 2015 to 16 in 2019. India and Germany had minimal or no contributions before 2019.

After the onset of the pandemic, there was a notable surge in research output across all countries. The United States saw a dramatic increase, with articles jumping from 23 in 2020 to 85 by 2024. The United Kingdom also experienced significant growth, with articles increasing from 5 in 2020 to 43 in 2024. China's output surged even more, going from 15 articles in 2020 to 93 in 2024, indicating a rapidly expanding research focus in AIHRM. Italy and India similarly saw substantial increases, with Italy's contributions growing from 16 in 2020 to 35 by 2024, and India's from 17 in 2020 to a remarkable 110 by 2024. Germany, which had no contributions before 2019, rapidly increased its output from 7 articles in 2020 to 35 in 2024.

Most Citied Country

The figure displays the most cited countries in AIHRM research, comparing data from before and after COVID-19. It reveals a marked increase in citations for certain countries post-pandemic, indicating heightened influence and recognition of their research contributions. This trend underscores the global academic community's growing focus on AIHRM.

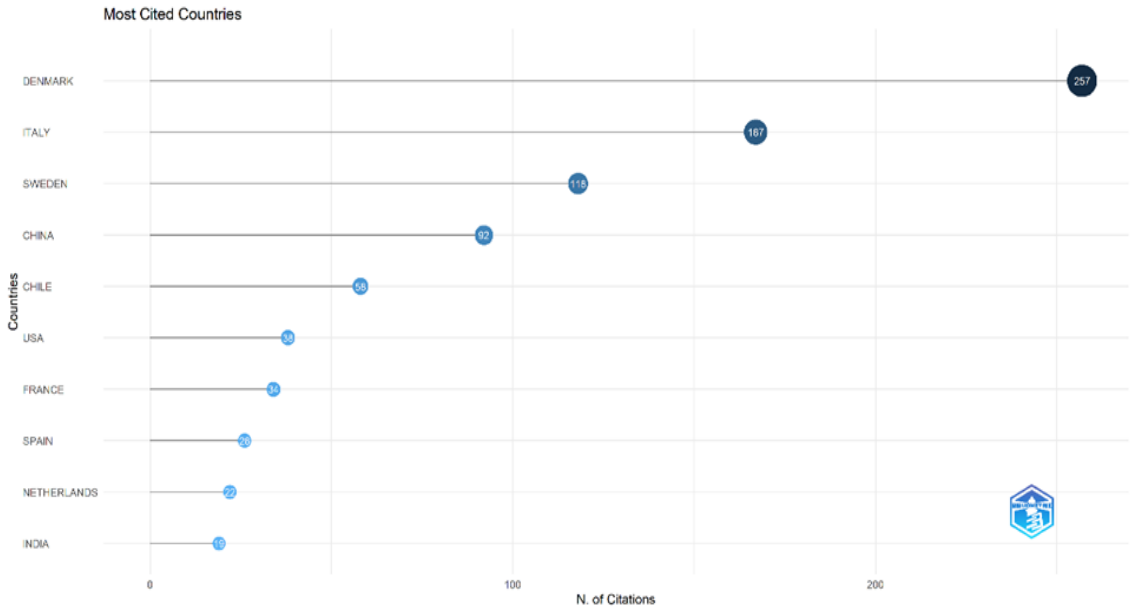

Figure 11: Most citied country before Covid-19

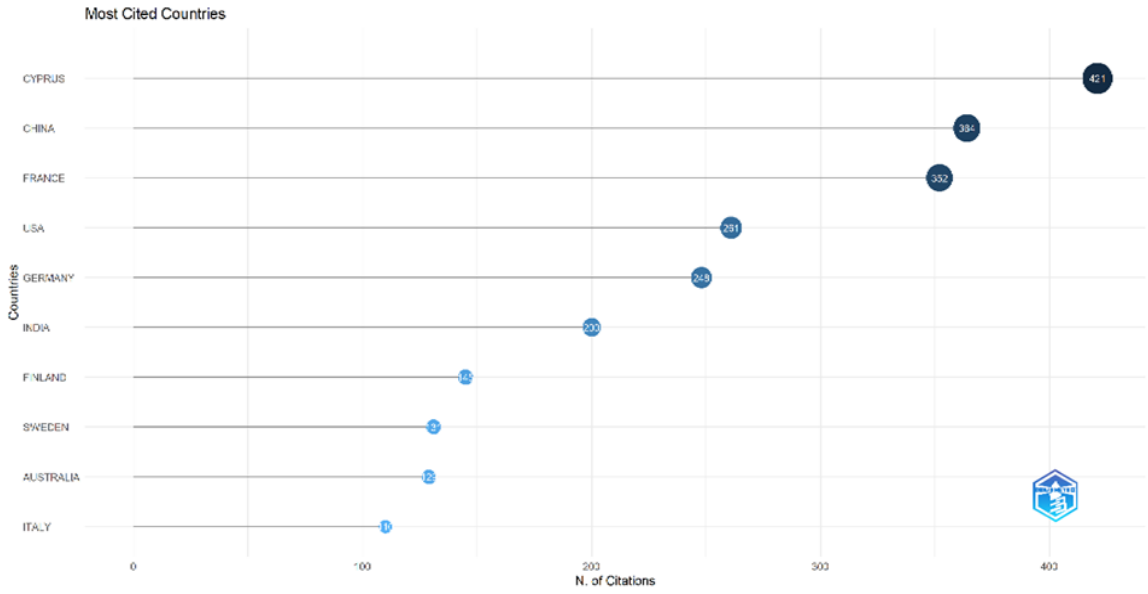

Figure 12: Most citied country after Covid-19

Before the pandemic, Denmark led with a remarkable 257 average citations per article, suggesting a high impact of its limited number of articles. Italy and Sweden followed with average citations of 55.7 and 118 respectively, indicating significant contributions from a smaller number of highly cited works. China had a notable average of 46 citations per article, reflecting substantial research engagement and recognition. Other countries like Chile, USA, France, Spain, Netherlands, and India also made their mark with varying average citation counts, highlighting a diverse set of influential contributions worldwide.

After the pandemic, the landscape of highly cited countries shifted, with Cyprus emerging as a new leader, achieving an impressive 210.5 average

citations per article, suggesting a few highly impactful works. China continued to be a major player with a total citation count of 364, though the average dropped to 21.4, indicating a broader but less concentrated citation impact. France and Germany also rose in prominence with average citations of 50.3 and 31 respectively, reflecting a growing influence in the field. The USA and India, while still significant in total citations, had lower average citations per article (14.5 and 14.3), indicating a larger volume of publications but with a more distributed impact. Finland, Sweden, and Australia entered the list of most cited countries, showing increased global interest and diverse contributions post-pandemic. Italy's average citations per article decreased to 18.3, indicating sustained but less concentrated influence.

Trend topic in AI-HRM

The figure depicts trending topics in AI-HRM research before and after COVID-19. It shows a shift in focus pre-pandemic towards foundational AI applications in HRM, evolving post-pandemic to emphasize topics. This reflects the adaptation of research priorities to address new challenges and opportunities arising from the pandemic's impact on workforce dynamics.

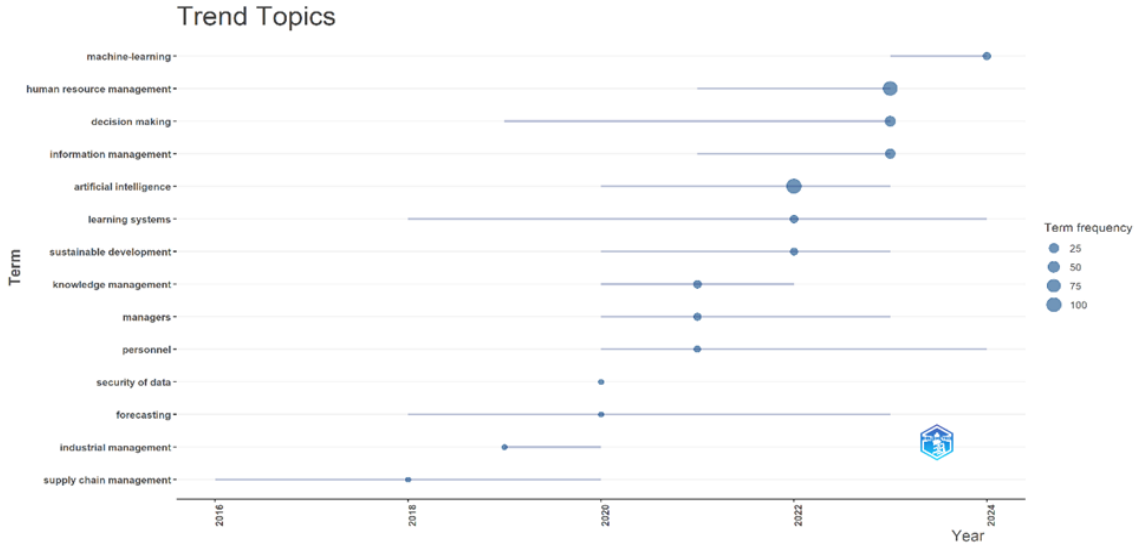

Figure 13: Trend topic in AI-HRM before and after Covid-19

In the field of AI-HRM, "artificial intelligence" emerges as the dominant trend with 106 occurrences, peaking from 2020 to 2023, reflecting its pivotal role in reshaping HR practices. "Human resource management" shows robust growth with 92 entries, focusing sharply from 2021 to 2023. "Learning systems" and "decision making" are also prominent, evolving steadily from 2018 to 2024 and 2019 to 2023 respectively. Other topics like "knowledge management" and "information management" exhibit ongoing interest, spanning from 2020 to 2022 and 2021 to 2023.

These trends underscore a dynamic landscape where AI integration and strategic HRM practices are pivotal areas of research focus, driven by technological advancements and evolving organizational needs.

Word in AI-HRM

The figure illustrates word frequency in AI-HRM research before and after COVID-19. It highlights a change in emphasis, with pre-pandemic terms focusing on AI applications in traditional HR practices, shifting post-pandemic. This reflects the accelerated adoption and integration of AI technologies in response to the changing landscape of work brought about by the pandemic.

Before COVID-19, key terms in AI-HRM research included "artificial intelligence" with 24 occurrences, "human resource management" with 15, and "decision making" with 11, reflecting foundational research areas. Terms like "decision support systems," "learning systems," and "information management" also featured, each with significant but fewer mentions. Post-pandemic, "artificial intelligence" surged to 82 occurrences, underscoring its expanded role in HRM. "Human resource management" remained prominent with 77 occurrences, while "information management" and "decision making" maintained relevance with 25 and 23 mentions respectively. New terms such as "human resources management," "resource allocation," and "natural resources management" emerged, reflecting evolving research priorities in HR practices.

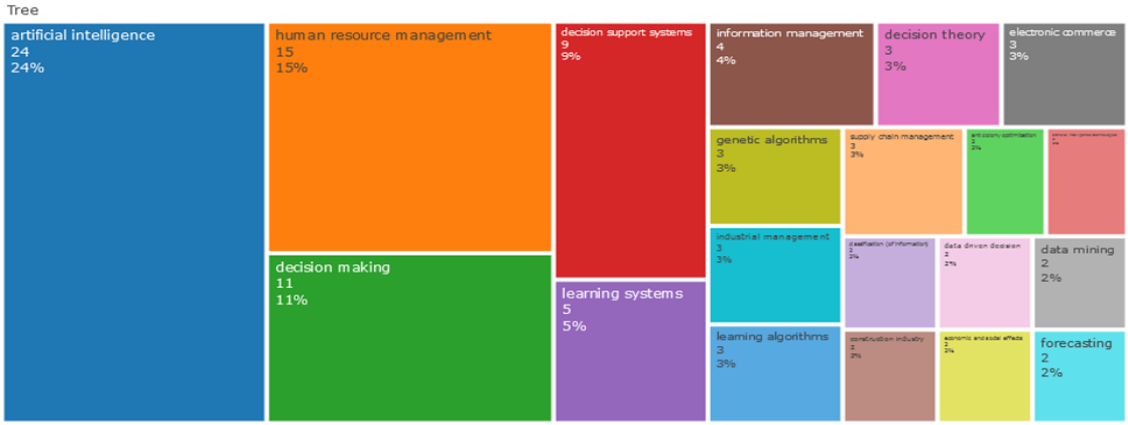

Figure 14: Word in AI-HRM before Covid-19

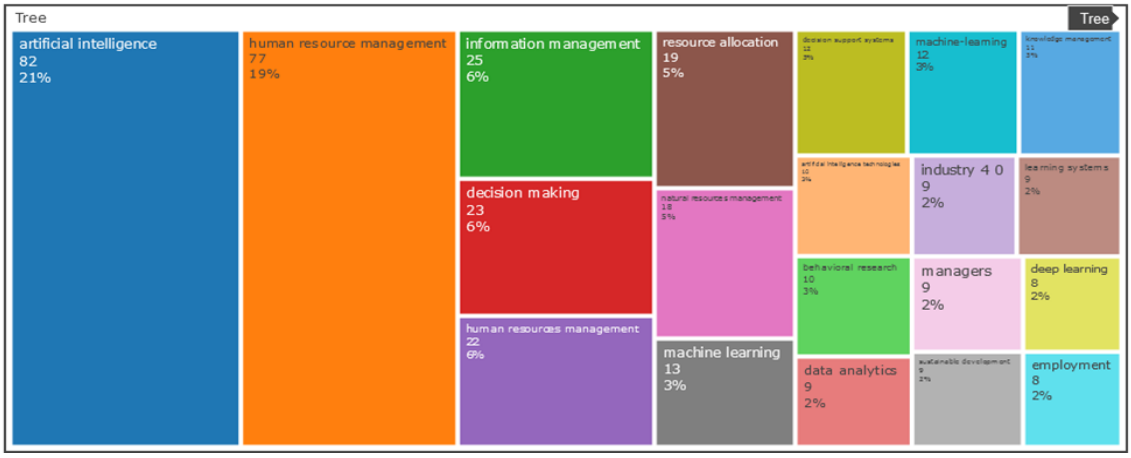

Figure 15: Word in AI-HRM after Covid-19

Additionally, "machine learning" and "machine-learning" each appeared 13 times, highlighting their integration into AI-driven HRM strategies. Overall,

the shift post-pandemic signals an intensified focus on advanced technologies and strategic HR management in response to global challenges.

Thematic Map

The figure presents a thematic map of AI-HRM research before and after COVID-19, showing distinct thematic clusters. This illustrates the shift in research focus towards addressing pandemic-driven changes in workforce dynamics and organizational practices.

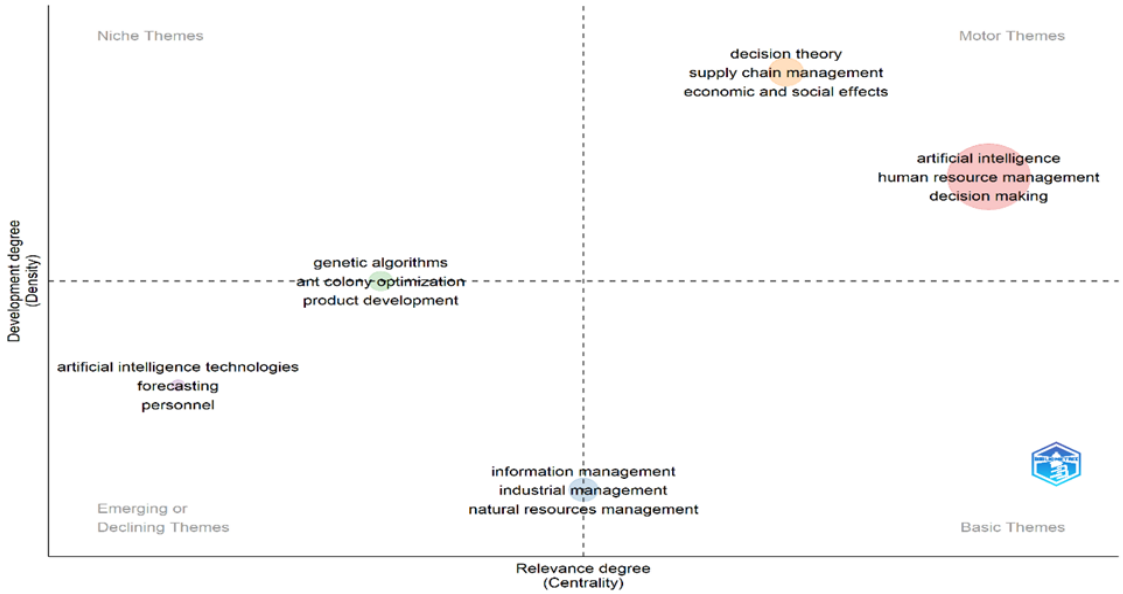

Figure 16: Thematic Map of AI-HRM before Covid-19

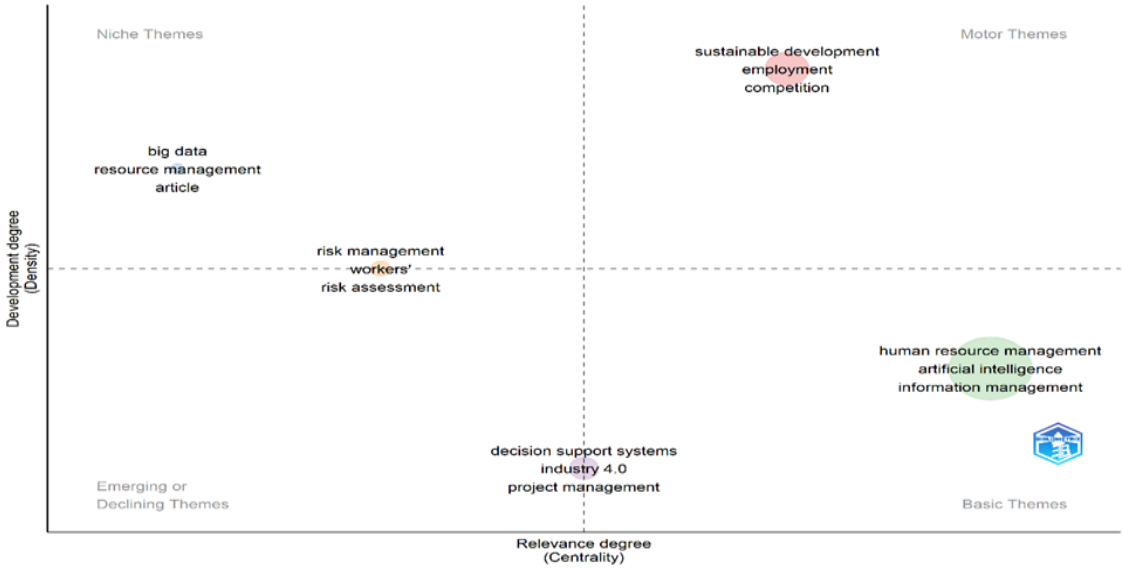

Figure 17: Thematic Map of AI-HRM after Covid-19

The thematic analysis before and after COVID-19 reveals significant shifts in the focus and development of various themes in the context of their relevance (centrality) and development degree (density). Before COVID-19, motor themes

such as decision theory, supply chain management, and economic and social effects were highly developed and central, indicating their critical importance and well-established nature. Basic themes like information management, industrial management, and natural resources management were highly relevant but less developed, suggesting they were essential but required more research and advancements. Niche themes, including genetic algorithms, ant colony optimization, and product development, were well-developed yet specialized and not central to the main discourse. Emerging or declining themes, such as artificial intelligence technologies, forecasting, and personnel, were less developed and not central, indicating they might have been either emerging fields or areas in decline.

Post-COVID-19, there has been a notable shift in focus. Sustainable development, employment, and competition have emerged as motor themes, reflecting the pandemic's significant impact on global sustainability and employment dynamics. Human resource management, artificial intelligence, and information management have gained relevance but still require further development, showing a shift towards managing human resources and leveraging AI in the post-pandemic world. The niche themes have shifted from technical algorithms and optimization pre-COVID to big data and resource management post-COVID, indicating a broader interest in data utilization. Additionally, risk management has emerged as an important theme, likely due to the heightened awareness of uncertainties and the need for better risk assessment mechanisms. Overall, the thematic landscape post-COVID-19 highlights a significant shift towards sustainability, employment, and the integration of AI in human resource management, reflecting the pandemic's long-lasting impact on various sectors and research priorities.

Key Changes and Observations

Increased Focus on Sustainability and Employment: Post-COVID, sustainable development and employment have become motor themes, reflecting the pandemic's influence on economic and social policies.

Rise in Relevance of AI and Human Resource Management: The relevance of AI and HR management has increased, indicating a shift towards digital transformation and efficient management of human resources in the new normal.

Shift in Niche Themes: There is a movement from technical algorithms and optimization pre-COVID to big data and resource management post-COVID, showing a broader interest in data utilization.

Emergence of Risk Management: Risk management has appeared as an emerging theme, likely due to the heightened awareness of uncertainties and the need for better risk assessment mechanisms.

DISCUSSION

The bibliometric analysis of AI in Human Resource Management (AIHRM) research from 2015 to 2024 reveals significant trends influenced by the COVID-19 pandemic. Research output increased significantly starting in 2020, highlighting the importance of AI and digital transformation in HRM and rapidly increasing research interest and output. Pre-pandemic, AIHRM

research was dispersed across niche journals, indicating broad but shallow engagement consistent with an exploratory phase. Post-pandemic, research became concentrated in prominent journals like Human Resource Management Review, signaling a maturing field. Pre-pandemic contributions were widespread with no dominant authors, reflecting a broad but less focused research landscape. Post-pandemic, a core group of prolific authors, such as MALIK A and LI Y, emerged, suggesting increased specialization. Institutionally, contributions were spread globally pre-pandemic, but post-pandemic, institutions like Aston University and Poznan University of Technology became key players, reflecting more focused research efforts, increased funding, and global collaboration. Countries like the United States, China, and India showed dramatic increases in research output post-pandemic, with Cyprus and China achieving high citation impacts. The pandemic acted as a catalyst for AIHRM research, driving nations to explore innovative workforce management solutions. Pre-pandemic, research focused on foundational AI applications and traditional HR practices, with terms like "artificial intelligence," "human resource management," and "decision making" being prominent. Post-pandemic, research shifted towards advanced AI technologies and strategic HR management, reflecting responses to evolving global challenges and workforce dynamics. Emerging themes post-pandemic included "artificial intelligence," "human resource management," "learning systems," "decision making," "knowledge management," and "information management," underscoring the critical role of digital transformation in addressing new workforce challenges and organizational practices. Thematic analysis showed a shift from decision theory and technical algorithms pre-pandemic to sustainable development, employment, and AI integration in HRM post-pandemic, indicating a strategic focus on adapting to pandemic-induced changes in workforce dynamics and organizational strategies. Emerging themes such as risk management and big data underscore the importance of leveraging robust data for workforce challenges, while foundational research areas like recruitment, selection, onboarding, training, performance analysis, talent acquisition, and management and retention remain pivotal. Overall, the pandemic significantly influenced AIHRM research, accelerating publication growth, focusing research efforts, and highlighting the critical role of AI and digital transformation in modern HRM practices.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This comprehensive bibliometric study uncovered substantial changes in the AI-HRM research landscape coinciding with the COVID-19 pandemic. It revealed exponential surges in publications, shifting patterns in influential authors, institutions and countries, and transformational impacts on priority topics. These adaptive developments demonstrate how crises can catalyze fruitful evolution in timely and meaningful directions. Going forward, continued internationalization and diversification will enrich the field's avenues of inquiry. Deeper contextual considerations attuned to localized complexities

can further strengthen applied solutions. Overall, maintaining a balanced perspective respectful of humanity's social imperatives will be paramount as knowledge advances. If guided responsibly, evolving AI-HRM frameworks show promising potential to optimally support organizational progress and humanity's shared prosperity through sensitivity to both technical and humanistic design priorities.

Recommendations

Investigate underexplored HR functions like on boarding, training, performance analysis, talent management, and retention for AI integration, and balance technical and managerial components of T-HRIS. Analyze the effects of the COVID-19 pandemic on AI-HRM research trends, sources, authorship patterns, and thematic evolution through comprehensive bibliometric studies. Encourage continued development and diversification in AI-HRM research to provide new insights and solutions for organizational challenges in the digital age.

ADVANCED RESEARCH

The study covers only the period from 2015 to 2024, which may limit the understanding of long-term trends and developments in AI-HRM integration. Data is sourced exclusively from the Scopus database, potentially excluding relevant research from other databases and limiting the comprehensiveness of the analysis.

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