

Examining the Role of Technology in Recruitment Processes: A Bibliometric Review and Research Agenda

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Abstract :

Online recruitment has become essential for HR professionals, offering candidate assessment, faster integration, and access to qualified candidates through artificial intelligence. This research aims to analyze the scientific production surrounding recruitment through artificial intelligence by conducting a bibliometric analysis based on the PRISMA method. The VosViewer visualization software was chosen for its effectiveness. This study focused on all research conducted between 2019 and 2023. A total of 127 publications were analyzed in May 2024, as documented in the Scopus database, after applying inclusion and exclusion criteria. The results highlight the topics addressed, the most prolific authors, countries, and institutions involved. This research underscores a lack of research in the field of AI-driven recruitment over the past five years.

Keywords : Recruitment - Social networks - E-recruitment - HRM - Artificial intelligence - Bibliometric analysis.

JEL Classification : O10, O15, O33.

Paper type: Theoretical Research.

1. Introduction

The rapid evolution of digital technologies has profoundly transformed organizational practices, particularly in the field of human resource management. The integration of artificial intelligence (AI) into recruitment processes represents a significant shift, enabling the automation, streamlining, and optimization of activities related to talent identification and selection (Black & van Esch, 2020; Galindo & León, 2023). Technologies such as social networks, MOOCs, chatbots, and big data analytics systems provide tailored solutions to the needs of modern enterprises (Danvila-del-Valle et al., 2019; Wang et al., 2021).

One of the main advantages of AI in recruitment lies in its ability to reduce human biases while increasing the transparency and efficiency of decision-making in talent management processes (Roumbanis, 2025). However, ethical implications and the reliance on algorithmic data raise significant concerns regarding the reliability and fairness of AI-based systems (Ligeiro et al., 2024; Marinakou et al., 2024). Although the transformative potential of AI in HR practices is widely recognized, specific research addressing its bibliometric impacts on recruitment remains limited (Subramanian et al., 2023; Samsul et al., 2023).

Bibliometric analyses, as powerful methodological tools, allow researchers to map research trends, identify scientific collaborations, and uncover emerging themes in a given field (Danvila-del-Valle et al., 2019). However, in the context of AI-enabled intelligent recruitment, these analyses are still underutilized, limiting the comprehensive understanding of academic contributions and future opportunities in this expanding field.

This study, therefore, proposes a bibliometric analysis to examine academic publications on AI-enabled intelligent recruitment between 2019 and 2023. It seeks to address the contributions made in this field and explore future research directions. The central research question is formulated as follows: **What dynamics, trends, and gaps can bibliometric analysis reveal about academic publications on artificial intelligence in recruitment between 2019 and 2023?** This research is guided by the following questions:

- What is the distribution of publications on artificial intelligence in recruitment during this period?
- Which scientific journals, authors, and collaborative networks stand out in this domain?
- What keywords and themes emerge from studies focused on intelligent recruitment?
- What scientific gaps can be identified for future research exploration?

To address these questions, this study relies on data from Scopus databases and employs scientific mapping tools. The aim is to provide a comprehensive overview of current research while offering insights for researchers and practitioners at the intersection of AI and recruitment. By adopting a bibliometric approach, this study aims to highlight dominant trends, academic collaborations, and underrepresented themes in this domain while emphasizing the theoretical and practical implications of integrating AI into talent management processes.

2. Theoretical Background

In this first part of our work, we will detail the concepts related to Artificial Intelligence (AI) and its evolving role in Human Resources (HR) management, particularly in the recruitment and selection process. We will explore the historical development of AI, its integration into HR practices, and its impact on efficiency and decision-making within the recruitment function. By examining the contributions of key researchers and the technological advancements that have shaped AI's role in HR, we will provide a comprehensive overview of how AI is reshaping recruitment, improving candidate sourcing, and enhancing organizational productivity.

Additionally, we will analyze both the positive and potential negative perceptions associated with AI-driven recruitment processes, considering how these factors influence candidate engagement and organizational outcomes.

2.1. Artificial Intelligence (AI)

The concepts of artificial intelligence and recruitment were theoretically explained in detail by Ligeiro et al. (2024) in their article. Building on this foundation, artificial intelligence (AI) is a research field that has evolved since its early conceptualizations in the 1950s. Although it is impossible to pinpoint a single inventor of AI, several pioneering researchers, such as John McCarthy, Alan Newell, and Marvin Minsky, are recognized for laying the foundations of this technology (OECD, 2019). AI has its roots in Alan Turing's 1950 paper, "Computing Machinery and Intelligence," which introduced the idea of machines capable of simulating human intelligence (Turing, 1950). This field of research has undergone periods of stagnation, notably during what is known as the "AI winter" (Smith et al., 2006), but regained momentum in the 1990s due to technological advancements in data storage and processing power (OECD, 2019).

Over the decades, AI has diversified its applications, particularly in Human Resource Management (Chapman et al., 2003). This evolution has allowed AI to increase business competitiveness, particularly by facilitating access to passive candidates—those not actively seeking a job but open to opportunities (Black & van Esch, 2021). The rise of AI is driven by social, strategic, and financial factors (Jain et al., 2021) and is part of the Fourth Industrial Revolution, marked by the emergence of technologies such as big data, robotics, the Internet of Things, and digital platforms (Correio et al., 2021).

However, this rapid evolution of AI presents challenges for traditional management systems. AI, capable of analyzing, interacting, and learning autonomously, raises questions about the role of managers in the face of the "inhuman" capabilities of machines (Chernov & Chernova, 2019). As a result, decision-makers must adapt to a reality where AI solves complex problems without human intervention (Chui et al., 2016). The acceptance of AI is a phenomenon studied by several researchers, including Gerlich (2023, 2024), who concludes that AI is preferred due to its superior reliability compared to humans.

2.2. AI in Recruitment and Selection Processes

Traditional recruitment methods, such as mass media advertisements, are gradually being replaced by online recruitment tools, including e-recruitment (Ligeiro et al., 2024; Garg et al., 2021). The integration of AI into these processes enables more efficient human resource management, particularly by significantly reducing the time spent on administrative tasks and increasing the return on investment (ROI) for businesses (Ligeiro et al., 2024; Lee, 2011; Buckley et al., 2004). According to Egorov et al. (2020), AI's continuous learning optimizes recruitment processes by automating tasks such as interviews and candidate assessments, thus enhancing efficiency.

AI also transforms online recruitment practices, enabling companies to autonomously collect and analyze data on candidates. Autonomous platforms place unsuccessful candidates in databases and reactivate them when needed, optimizing the recruitment process for companies (Ligeiro et al., 2024; Garg et al., 2021; Derous & de Fruyt, 2016).

One of the most discussed aspects of AI in recruitment is its ability to expedite the screening and initial evaluation of candidate resumes. This process, traditionally manual and time-consuming, is now significantly enhanced through AI-powered algorithms. These algorithms are designed to identify key patterns in resumes and match them with job descriptions, ensuring a closer alignment between candidate skills and job requirements. As a result, AI not only speeds up the recruitment process but also improves person-job fit, which contributes to better selection outcomes (Ligeiro et al., 2024; Nawaz, 2019). According to Wang et al. (2021), AI

tools have a dual impact on recruitment by increasing the volume of quality applications and improving the chances of applicants being matched with suitable roles. This is largely because AI systems are perceived to offer a novel and interactive approach to job applications, which in turn encourages more candidates to apply.

3. Research Methodology

Our study is based on bibliometric analysis using the PRISMA method (Moher et al., 2009). Our objective is to analyze the evolution of artificial intelligence in the field of recruitment. This analysis enables us to examine the top countries, the top universities, the most cited authors in this field, the most used keywords and the relationship between them, and the journals that have published the most articles on the subject. According to a study by (Roblek et al., 2022), “qualitative methods such as observation and interviews can also be used for analysis”. However, bibliometric analysis is based on the scientific mapping approach. It applies the generic visualization and domain analysis process, enabling network analysis of both scientific groups and research domains”. VOSViewer is one of the most widely used software packages for visualizing bibliometric networks. Version 1.6.20, released on October 31, 2023, was used to visualize and analyze the bibliographic data in our study.

3.1. Identification

Database selections:

Search contributions use the terms recruitment and artificial intelligence interchangeably. An initial search revealed 2257 documents associated with these terms. This study was carried out on May 01, 2024. We chose the Scopus database as the main basis for this research. This database was chosen because it is one of the most well-known and reliable databases in order to visualize bibliometric networks, as well as covering highly credible journals from different categories and excluding articles from non-scientific journals and magazines (Mulet-Forteza, 2019).

Search stage:

To ensure the relevance of the selected studies, the researchers used exact keywords, namely (“recruitment” AND “artificial intelligence” OR “social media”). In addition, publications from the last five years were selected, from 2019 to 2023. For example, “AND PUBYEAR > 2018 AND PUBYEAR < 2024”. In addition, the field was limited to business and management accounting (LIMIT-TO (SUBJAREA, “BUSI”). Publications were limited to articles (LIMIT-TO (DOCTYPE, “ar ‘)) in English (LIMIT-TO (LANGUAGE, ‘English”).

3.2. Inclusion and exclusion criteria

Table 1. Inclusion and exclusion criteria

Inclusion	Exclusion
"Recruitment" AND "artificial intelligence" OR "social media"	Keywords outside this scope were not considered.
Publication years: 2019-2023	Publications dated before 2019 or after 2023 were excluded.
Language: English	All other languages
Document type: articles	Conference papers, books, and book chapters.

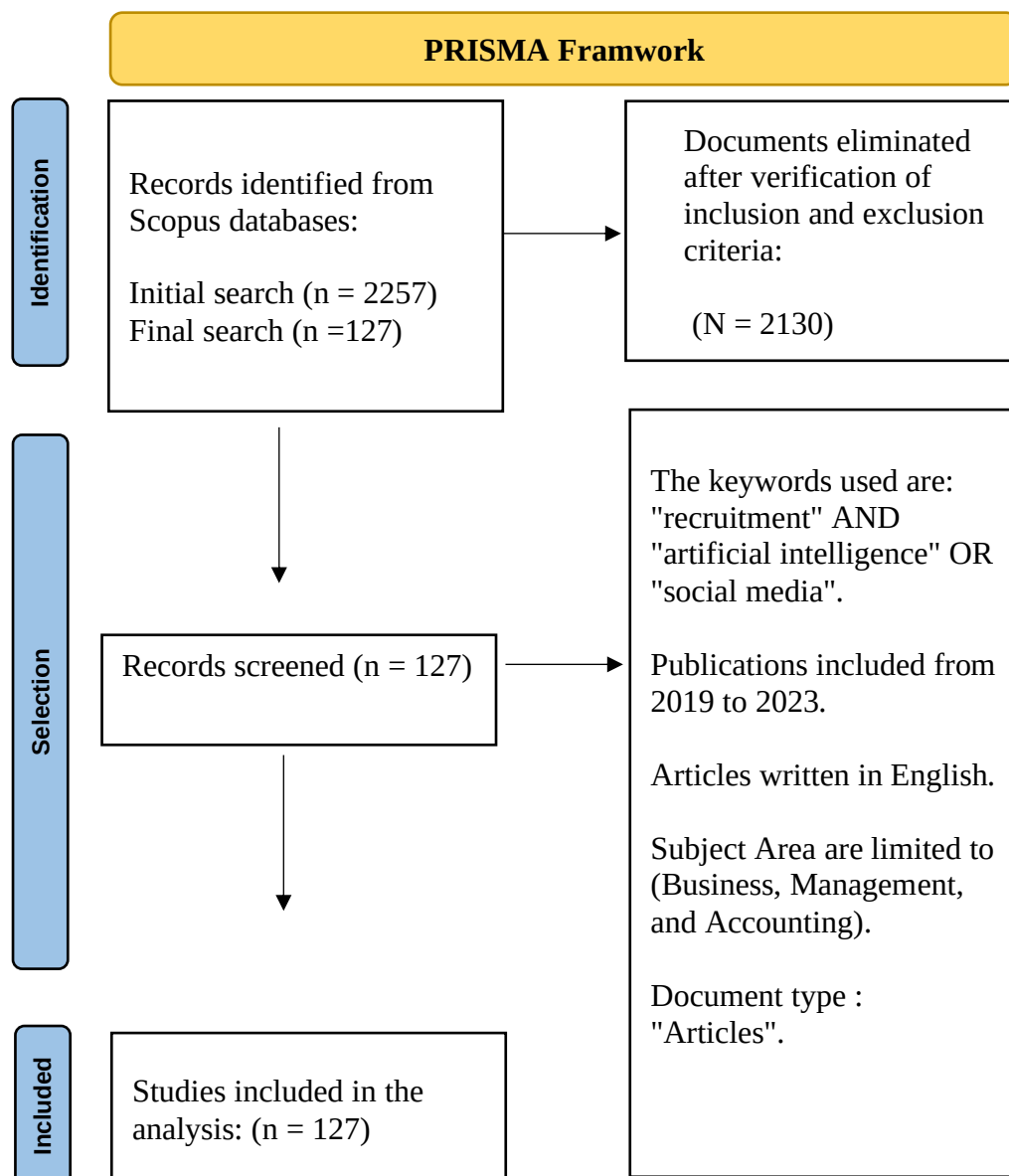
Source: Author.

3.3. Selection

The main keywords used focused on “recruitment” AND “artificial intelligence” OR “social media”, resulting in 2257 documents. After applying the inclusion and exclusion criteria shown in Table 1, the publications were reduced to 127 documents in the final search, due to the

exclusion of 2130 of them. This bibliometric study is based on the PRISMA method (figure 1). The following section begins with the research questions.

Figure 1. The process of systematic literature analysis using the PRISMA model is based on three phases: identification, selection and inclusion.



Source. Author's elaboration based on the PRISMA methodology (Moher, 2009).

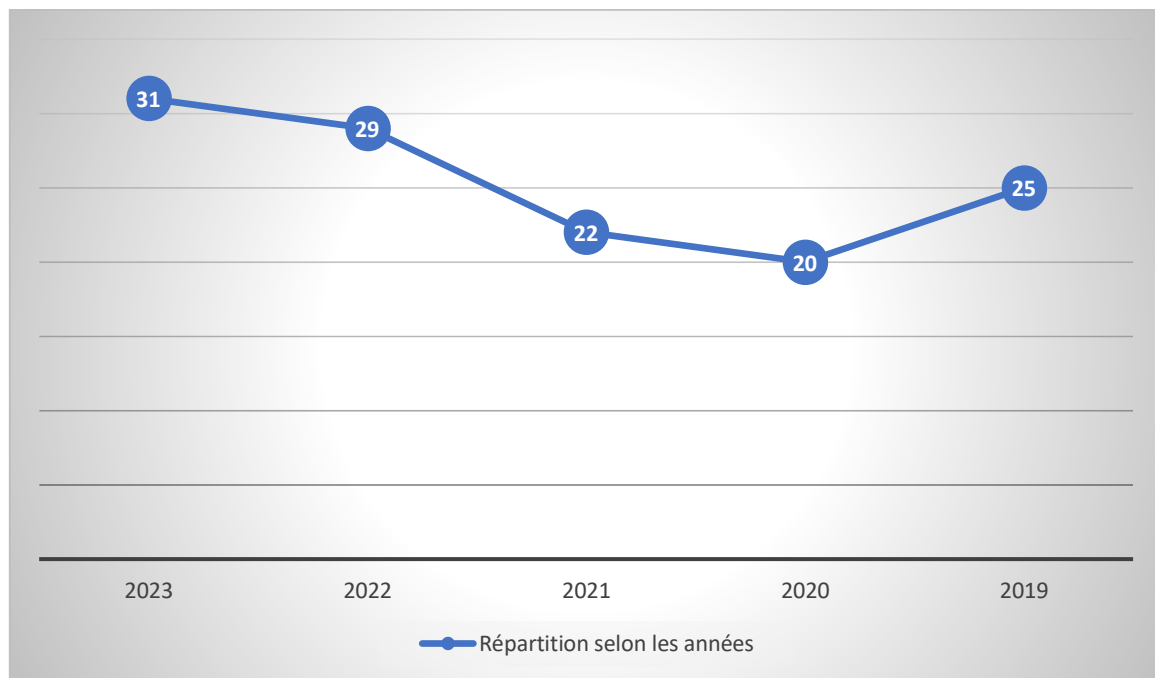
4. Results

In this section, we will address the following research questions:

4.1. What is the distribution of publications on recruitment and artificial intelligence from 2019 to 2023?

To address our research question, an analysis was conducted on the temporal distribution of publications related to recruitment and artificial intelligence from 2019 to 2023. A moderate and limited evolution was observed, as shown in Figure 2. In 2023, a total of 31 publications concerning AI and recruitment were identified, while 29 publications were recorded in 2022. However, in 2019, the number of publications stood at 25.

Figure 2. Evolution of the Number of Publications by Year



Source. Derived from the Scopus database.

4.2. Which are the most relevant journals in smart recruitment research?

In the content analysis conducted, the most cited journals were identified based on the following analysis criteria: "Total Publications", "Total Citations", "Journal Citation Score", "Most Cited Article", "Citation Time", and "Publisher", as shown in Table 2.

Table 2 shows that the most productive journal concerning artificial intelligence and recruitment is "Technological Forecasting and Social Change" with a total number of publications of 2602 and a total number of citations of 55191, followed by "Decision Support Systems" with a total number of publications of 426 and a total number of citations of 6245, in addition to "International Journal of Human Resource Management" with a total number of publications of 562 and a total number of citations of 6574. Followed by "Human Resource Management" with 171 publications and 1947 citations. Question 3 also studied the most prolific authors in the field of intelligent recruitment research. In the content analysis carried out for prolific authors in the field of AI and recruitment research, "author", "total publications", "H-index", "total citations", "current affiliation" and "country" were chosen as analysis criteria, as shown in Table 3.

Table 2. The 10 Most Productive Journals in Recruitment and Artificial Intelligence (2019-2023)

Journals	TP*	TC*	Cite Score	Most Cited article	Cited by	Publisher
Journal of Marketing for Higher Education	58	451	7.8	The influence of university brand image, satisfaction, and university identification on alumni WOM intentions	24	Taylor & Francis
Management Research Review	321	1920	6.0	Total quality management practices and corporate sustainable development in manufacturing companies: the mediating role of green innovation	38	Emerald Publishing
Technological Forecasting and Social Change	2602	55191	21.2	Digital finance and green growth in China: Appraising inclusive digital finance using web crawler technology and big data	79	Elsevier
Decision Support Systems	426	6245	14.7	CATCHM: A novel network-based credit card fraud detection method using node representation learning	35	Elsevier
Academic Journal of Interdisciplinary Studies	653	945	1.4	A Psycho-Sociological Study of Converted Kazakhs in Kazakhstan	5	Richtmann Publishing Ltd
Economics And Sociology	286	1534	5.4	EMOTIONAL INTELLIGENCE AND KNOWLEDGE SHARING AS KEY FACTORS IN BUSINESS MANAGEMENT – EVIDENCE FROM SLOVAK SMES	11	Centre of Sociological Research
Human Resource Management	171	1947	11.4	Sustainable human resource management practices, employee resilience, and employee outcomes: Toward common good values Sustainable human resource management practices, employee resilience, and employee outcomes: Toward common good values	53	Wiley-Blackwell
International Journal of Business Innovation and Research	333	699	2.1	The influence of creative self-efficacy, creative self-identity, and creative process engagement on innovative behaviour	7	Inderscience Publishers

International Journal of Human Resource Management	562	6574	11.7	Remote workers' well-being, perceived productivity, and engagement: which resources should HRM improve during COVID-19? A longitudinal diary study	<u>27</u>	Taylor & Francis
International Journal Of Organizational Analysis	429	2549	5.9	An organizational analysis of how managers must understand the mental health impact of teleworking during COVID-19 on employees	30	Emerald Publishing

TP: Total Publication, TC* : Total Citation*

Source. Derived from the Scopus database.

3.3 Who are the most productive authors in the research field in recruitment and AI during 2019-2023?

Table 3 shows 20 prolific authors in the field of intelligent recruitment research. Indeed, the most prolific author was “Nawaz, Nishadv” with a total number of publications of 82, with the H-index standing at 18, in addition to a total out of 814 citations, and the author hails from Bahrain. Followed by “Jeske, Debora” with a total number of 67 publications, with an H-index of 20, in addition to a total of 1040 citations, and the author hails from Ireland. Then “Rajini, G.” from India with a total of 39 publications, an H-index of 6 and 82 citations.

Table 3. Affiliation of the most represented authors by category for publications on recruitment and artificial intelligence

Authors	Year of First Publication	Total Publications	H-index	Total Citations	Current Affiliation	Contry
Ahamad, Faiz	2019	6	3	31	XIM University, Bhubaneswar	India
Jeske, Debora	2008	67	20	1040	University College Cork	Ireland
Kaur, Davinder	2018	3	3	24	Punjab Technical University, Jalandhar	India
Kaur, Rajpreet	2020	6	4	32	Punjab Technical University, Jalandhar	India
Kaushal, Neelam	2021	9	4	43	Lovely Professional University , Phagwara,	India
Keppeler, Florian	2020	8	5	104	Aarhus Universitet , Aarhus,	Denmark
Muduli, Ashutosh	2008	24	12	443	Pandit Deendayal Energy University	India
Nawaz, Nishad	2018	82	18	814	Kingdom University	Bahrain
Papenfuß, Ulf	2007	22	10	320	Zappelin University	Germany
Rajini, G.	13	39	6	82	Vels Institute of Science, Technology & Advanced Studies	India

Source. Derived from the Scopus database.

3.4 What are the top 10 countries dealing with recruitment and artificial intelligence from 2019 to 2023?

In the content analysis carried out to determine the most productive countries in the field of recruitment and artificial intelligence research, “country”, “total number of publications” and “most productive academic institution” were chosen as analysis criteria, as shown in Table 4 and Figures 3 and 4.

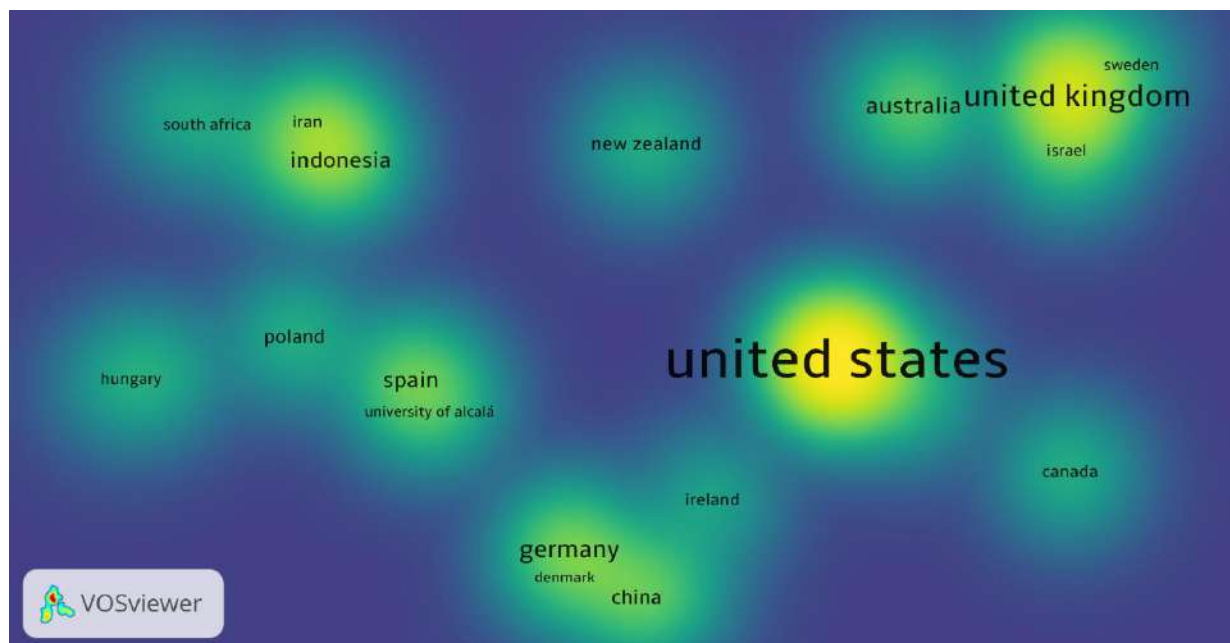
Table 4. Ranking of ten productive countries on recruitment and AI

Rank	Contry	Total Of publications	Most Productive Academic Institution
1	United States	30	Wharton School, Philadelphia, PA, United States
2	India	22	National Institute of Technology
3	United Kingdom	12	University of Leicester
4	Germany	8	University of Goettingen
5	Australia	7	La Trobe University
6	Indonesia	6	Czestochowa University of Technology
7	Spain	6	Kozminski University
8	China	5	University of Goettingen
9	Malaysia	5	Czestochowa University of Technology,
10	United Arab Emirates	5	University, London

Source. Data extracted from the Scopus database

Table 4 shows the 10 most productive countries in the field of AI-enabled recruitment research, and illustrates the breakdown by topic of the most prolific countries and institutions. From a country perspective, most of the countries listed showed a stable interest in all research topics related to intelligent recruitment. On the other hand, some countries showed particular interest in specific trends. For example, the most productive country was “United States”, with a total number of publications of 30 within Wharton School, Philadelphia, PA, United States. They were followed by “India” with a total number of publications of 22, at the University National Institute of Technology, and “United Kingdom” with a total number of publications of 12, at the University of Leicester. In addition, other prolific and productive countries in the field of recruitment research using artificial intelligence as an effective tool in this process are presented in figure 3.

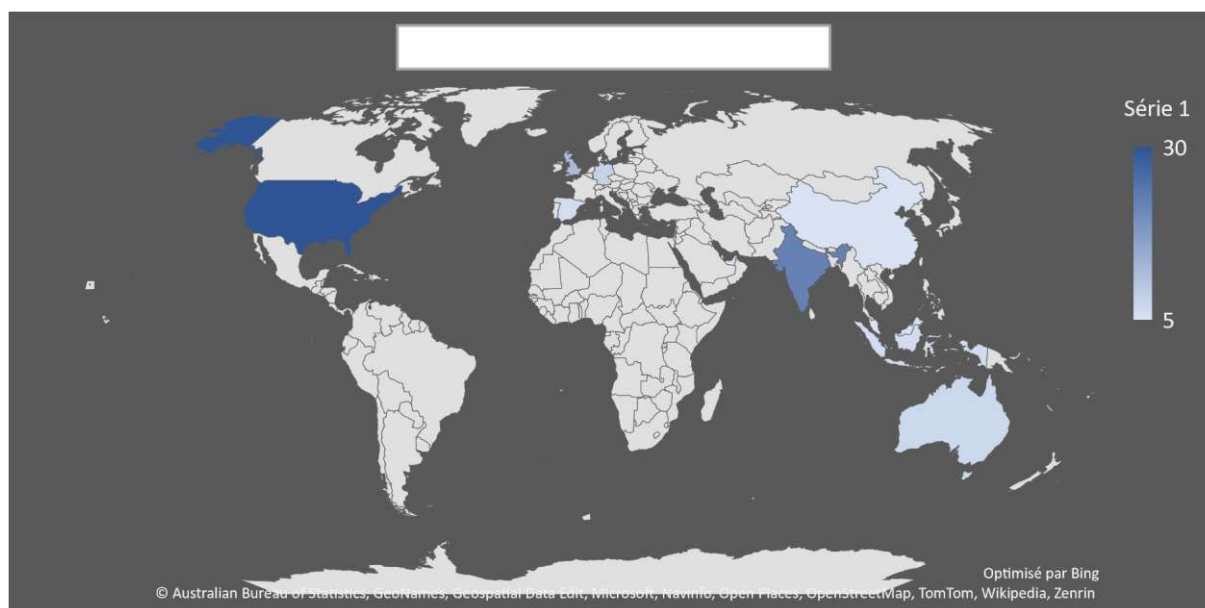
Figure 3: VosViewer map of top-ranked countries.



Source. extracted from VosViewer

This heatmap shows which countries have published the most research papers on intelligent recruitment from 2019 to 2023. The size of the country name indicates the volume of publications, with larger text signifying more publications.

Figure 4. Country visualization



Source. Compiled from the VosViewer

The USA emerges as the leading country, followed by the UK, Australia and Germany, among others. The heat map highlights areas with higher research activity in bright colors. In addition, India, the UK, Germany, Australia, Indonesia, Spain, China, Malaysia and the United Arab Emirates were ranked among the top 9 countries in terms of research activity. Less research has been published on this curial topic.

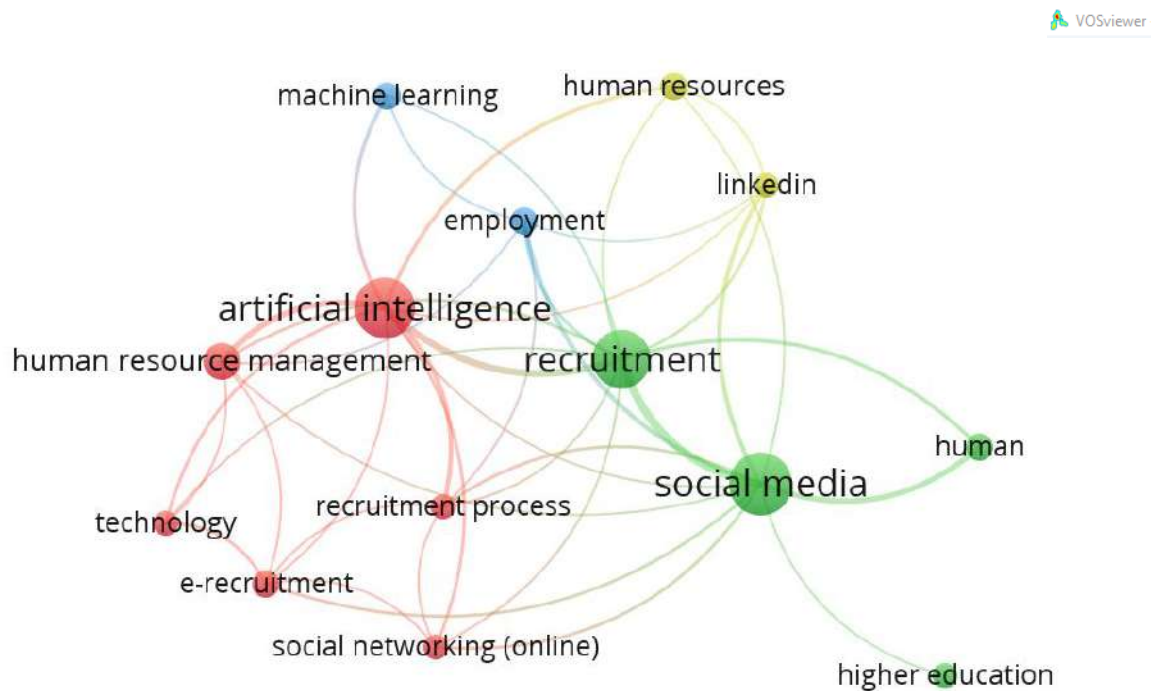
3.5 What were the main keywords used in intelligent recruitment over the years 2019-2023?

For the bibliometric analysis of the most frequently used keywords, “Co-occurrence” was selected as the type of analysis, and “All keywords” was marked as the unit. In this context, 14 keywords were identified from the dataset, as shown in Figure 5.

This network visualization displays the top keywords used in intelligent recruitment research from 2019 to 2023. The analysis used “co-occurrence” to identify frequently matched keywords within the same documents. The size of the nodes represents the frequency of the keywords, while the lines (edges) connecting them indicate the frequency with which these keywords appear together.

The visualization highlights artificial intelligence as a central keyword, strongly interconnected with terms such as recruitment, social media, technology, and machine learning. Social media emerges as another important node, closely linked to *recruitment, higher education, and LinkedIn. Additionally, notable keywords such as *human resources management, employment, and e-recruitment further illustrate the key themes. This visualization provides valuable insights into the main trends and relationships within intelligent recruitment research, shedding light on the connections between these critical concepts.

figure 5. Bibliometric network of keyword co-occurrence

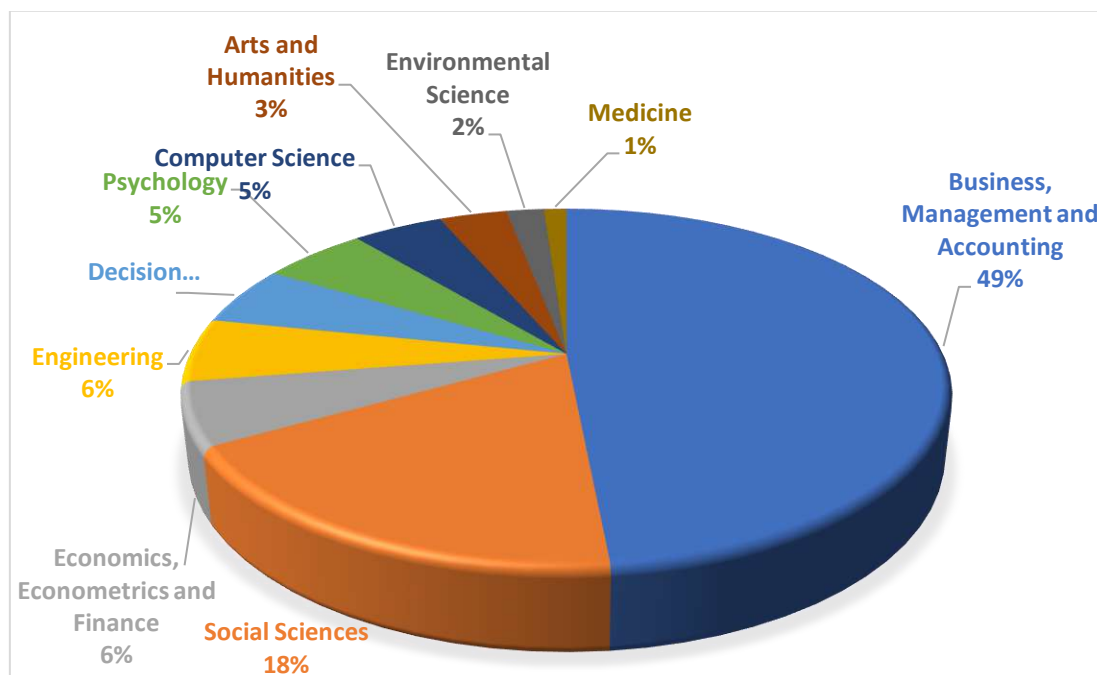


Source. extracted from VosViewer

3.6 What is the most important area involving intelligent recruitment through artificial intelligence?

The bibliometric study reveals a predominance of the fields of “Business, Management and Accounting” (49%) and “Social Sciences” (18%), suggesting a strong interest in integrating artificial intelligence into recruitment, particularly in business and societal contexts.

Figure 6. Themes associated with articles dealing with recruitment and AI



Source. Compiled from the Scopus Database

Economics, Econometrics and Finance” (6%), ‘Engineering’ (6%) and ‘Decision Sciences’ (5%) represent smaller shares, underlining their lesser but nonetheless relevant involvement in this issue.

5. Discussion

The aim of our study is to assess the performance of scientific research into recruitment in the age of artificial intelligence over the last five years, according to a number of quantitative indicators. E-recruitment is seen as a diverse and evolving phenomenon, beginning with the identification of candidates on social networks and continuing through the use of gamification of recruitment interviews, as well as the use of chatbots, to finally culminate in the use of artificial intelligence to match candidates and jobs (Oihab et al., 2021).

5.1 Publication trends and geographical distribution

The notable increase in scientific articles relating to the topic of recruitment through artificial intelligence, post-2019, indicates a growing focus by researchers on this area. Recruitment was probably triggered by the global transition to intelligent recruitment during the crisis. The Covid-19 situation highlighted the critical importance of online recruitment efficiency and showed the objective of following the evolution of digitalization, notably reinforced by the pandemic (Kulik, 2022), as well as other research highlighting the central role of digitalization in the transformation of HR functions, particularly for recruitment in the context of the pandemic (Strohmeier & Parry, 2014; Jedynek et al., 2021). The scientific scope of this study is underlined by the substantial contributions from countries such as the USA, the UK, and Australia, which are spread across the globe in these publications. However, some countries, such as China, Malaysia and the United Arab Emirates, have a less marked presence in the literature, suggesting a less in-depth treatment of this subject despite its interest.

5.2 Prolific authors and research keywords

The fundamental basis of current research is to understand the evolution of recruitment in the age of transformation. In addition, an extract analysis of the keywords used by the authors shows significantly consistent relationships. The results offer valuable insights into the vastness and interest of the field. Indeed, the most frequently used keywords are “recruitment”, “E-recruitment”, “artificial intelligence” and “social media”, which are linked to other technology-related words such as “technology” and “machine learning”.

5.3 Fields dealing with intelligent recruitment

The research covers a wide range of subjects, underlining the multidisciplinary nature of online recruitment. In our study, the field of business management and accounting is the most pronounced, where the use of artificial intelligence (AI) in recruitment is most widespread. This is due to the complexity of the skills required and the need to efficiently sort through a large number of applications. In addition, AI enables in-depth analysis of candidate data, facilitating fact-based decision-making. By automating administrative tasks, it also frees up time for higher value-added activities.

In summary, the results of this bibliometric study provide an overall analysis of scientific production on the subject of recruitment through artificial intelligence, according to specific criteria. Indeed, the subject has undergone a global transition over the years 2019-2023, accentuated by the COVID-19 crisis, with significant contributions from the USA, the UK and Australia. The most frequent keywords in the literature include recruitment, e-recruitment, artificial intelligence and social media, reflecting interest in the technological aspects of the recruitment process. In addition, business management and accounting emerge as the most

pronounced areas, where the use of AI facilitates candidate analysis and frees up time for higher value-added tasks.

6. Conclusion

This bibliometric analysis reveals several critical gaps in the academic literature regarding the role of artificial intelligence (AI) in recruitment practices. Despite the rising prominence of AI in human resource management, our study highlights a theoretical gap in the existing body of research. Specifically, there is a lack of comprehensive theoretical frameworks that integrate AI technologies into recruitment processes. The existing literature predominantly focuses on the technological aspects of AI, without sufficiently addressing the organizational, ethical, and socio-cultural dimensions of AI recruitment. This theoretical gap limits our understanding of how AI technologies are reshaping recruitment practices, as well as the challenges and opportunities they present. The analysis also reveals a significant empirical gap in the literature. Research on AI recruitment remains sparse, and much of the existing work is concentrated in a few specific geographical regions or industries, thus overlooking the global diversity of AI applications in recruitment. Moreover, longitudinal studies that explore the evolving impact of AI in recruitment are notably absent, leaving a gap in understanding how AI adoption impacts recruitment outcomes over time.

Further, the study exposes a methodological gap in how AI recruitment is studied. Most research relies on qualitative case studies or expert interviews, while there is a lack of quantitative studies that assess the effectiveness of AI tools in recruitment on a broader scale. This methodological limitation constrains the generalizability of findings and prevents the development of robust, evidence-based recommendations for AI recruitment practices. Additionally, the temporal gap in the research, with the exclusion of studies published after 2023, highlights the dynamic nature of AI technologies and the rapid pace of innovation in the field. As AI tools continue to evolve, it is essential for future studies to include more recent publications and incorporate emerging trends that could significantly alter recruitment strategies and their outcomes. **This study not only underscores the theoretical, empirical, and methodological gaps** that need to be addressed in the field of AI recruitment but also calls for a more holistic approach to studying the integration of AI in recruitment practices. Researchers are encouraged to adopt interdisciplinary perspectives, engage in longitudinal research, and explore the ethics, impact, and effectiveness of AI recruitment from diverse angles. Addressing these gaps will contribute to the development of a more comprehensive and actionable understanding of AI in recruitment, ultimately advancing the field and improving recruitment practices in the digital era.

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