MAPPING THE EVOLUTION OF ARTIFICIAL INTELLIGENCE IN HIRING AND RECRUITMENT: A BIBLIOMETRIC REVIEW

Sneha Phogat
Research Scholar, Department of Commerce
Chaudhary Bansi Lal University, Bhiwani, Haryana
E-mail: snehaphogat1904@gmail.com

Preeti Devi
Assistant Professor, Department of Commerce
Chaudhary Bansi Lal University, Bhiwani, Haryana
E-mail: preeti.commerce@cblu.ac.in

Deepak Gupta
Professor
Department of Commerce
Indira Gandhi University, Meerpur, Haryana
E-mail: deepak.commerce@igu.ac.in

HSB Research Review
Vol. 20 (1&2)
Jan - June 2025
July - Dec. 2025
ISSN: 0976-1179
57-73
The current issue and full text archive of this journal is available at https://www.gjust.ac.in/Page/Index_2_cap/HSB-Research-Review/3348

ABSTRACT

The study focuses on providing deep understanding of usage of Artificial Intelligence in hiring processes. Current research also lays emphasis on the reinvention of recruitment process, future trends, and challenges following the advent of Artificial Intelligence. Present study used bibliometric approach and 168 research papers of Scopus database was used for the analysis between the duration of 2000 to 2024. Biblioshiny was used in the analysis to help in findings out Influential Journals, Leading Authors, Leading Countries, Influential research articles and explore new research areas. The impact of literature related to Artificial Intelligence in Talent Acquisition were evaluated using quantitative metrics and social, intellectual, and conceptual network analysis. The results of the study reveal that Artificial Intelligence can foster the efficiency of recruitment process by making the various process and procedure automatic. Processes such as Interview Scheduling, Checking Resumes, and Candidates matchmaking can become cake walk with the usage of AI. It also makes recruitment better and fair because with the usage of AI the human intervention can be lessen which will make the selection free from bias, also helps in bringing more diversity to organization. To reduce the administrative workload of HR Managers and help them to focus more strategic decision making, the current study identifies key research gaps. This study being the synthesis of scattered literature offers novel information on how AI-based talent acquisition evolves, develops, and prospects.

Keywords: Artificial Intelligence, Talent Acquisition, Recruitment, Hiring, Bibliometric Analysis, R-Studio

INTRODUCTION

In the Recruitment process especially in Modern Recruitment, Artificial Intelligence has become an important phenomenon. Industries are transforming at a faster pace because of routine changes happening in Technologies. Artificial Intelligence has wonderful capability of analyzing the data at fast speed which helps organisations in screening prospective employees, identifying them, attracting and screening them more fastly than in Human Intervention. Recruitment and Hiring efficiency have become better after the integration of Artificial Intelligence in Hiring (Paramita *et al.*, 2024). Predictive Analytics,

Natural Language Processing (NLP) and Machine learning (ML) are the Artificial Intelligence (AI) tools which assists in making various recruitment and hiring process smarter (Zafar, 2024). If we talk about Human Resource, Candidate sourcing is the most pivotal application of AI. Artificial Intelligence makes the HR job easy by broadening the prospective employees' options, finding out the passive job seekers and along with all this making the hiring process more systematic (Hunkenschroer & Kriebitz, 2023). NLP Systems helps in application filtering according to the standards that were already set, and due to this system AI has become most key component of recruitment process (Thanka *et al.,* 2023). Biasness while hiring has been reduced with the usage of screening system where AI is involved. These systems not only increasing the speed of recruitment process but also complete their task with maximum precision and select candidates only aligning them with job criteria (Koivunen *et al.*, 2024).

Talent Acquisition

Talent acquisition (TA) is meant with the strategic process which implies identifying, attracting, and securing qualified jobseekers for specific positions within an organization. It's a crucial part of HR that consider everything from searching for candidates and reviewing applications to finally making them selected as an employee by providing the job offer (Vedapradha *et al.,* 2023).

Artificial Intelligence and Human Resources

There is a difference between the levels of understanding and decision making between Artificial Intelligence (AI) and Humans. AI is working purely on calculation basis while Humans finalized their decision after carefully thinking, using their reflection side and ethical reasoning as well. This difference between these two highlights a clear gap in their capabilities. The ability to judge has been considered a characteristic of human intelligence since Aristotle (350 BC/1955). Expert judgment, with its capacity for discernment, consider both knowledge and scientific investigation. However, further studies based on cognitive psychology has revealed that when your decision is on intuition or gut instincts it is generally biased. Even expert assessments such as of Judges, Academic Evaluators and Statisticians has also been found to be Systematic Biased (Roumbanis, 2017). One of the biggest challenges in modern machine learning is Monitoring, because their result drives from intricate interactions. It becomes difficult to comprehend and manage how they operate. It is even more difficult to make a trustworthy and reliable AI because of these complexities (Volchek, 2024).

BACKGROUND ON INCREASING ROLE OF ARTIFICIAL INTELLIGENCE

Online Recruitment

Before digital hiring platforms emerged in the mid-to-late 1990s, job searching was a manual and time-consuming process (Black & Van Esch, 2020). As job seekers was completely dependent on printed job advertisements in newspapers or physical job boards and once they identified an opportunity of suitable job they had to collect, complete and manually submit a paper application to the employer. E-recruitment which is an integral aspect of Human Resource Management (HRM) encompasses Internet-based hiring practices and web solutions aimed at achieving the same objectives as traditional (Ghazzawi & Accoumeh, 2014). Dhamija (2012) defines e-recruitment as the strategic use of online technologies especially websites for candidate assessment, interviewing, and hiring. Traditionally recruitment and selection process has proven to be labor-intensive and susceptible to both conscious and unconscious biases from HR professionals. This can lead to hiring decisions influenced by personal characteristics such as gender and age, resulting in potential discrimination (Rigotti & Pegoretti, 2024). There are some of platforms that basically interact with applicant through chat systems, LinkedIn, Glassdoor, Indeed and Monster and continuously evaluate and optimize the selection process to identify high-potential candidates (Horodyski, 2023). An effective hiring process creates a balanced workforce with the ideal combination of knowledge, skills, abilities, and attributes necessary for maintaining a competitive advantage (Rigotti & Pegoretti, 2024).

Ethical Considerations Surrounding AI in Recruitment

Despite the numerous advantages of incorporating AI into the employment process, there are moral dilemmas that cannot be disregarded (Bankins & Formosa, 2023). Questions of impartiality, privacy, transparency, and prejudice are fundamental to

these issues. One of the primary ethical quandaries is the data that AI systems depend on (Zafar, 2024). The biases that are systematic or historical in these datasets have the potential to be reproduced or even exacerbated by AI models (Kassir *et al.,* 2023). For instance, the AI may inadvertently perpetuate prejudice based on age, gender, ethnicity, or other characteristics if previous hiring data disproportionately favors specific demographics. Transparency is an additional ethical concern. Many of the AI tools employed in the employment process are "black boxes," which means that the decision-making process is concealed from both candidates and recruiters (Tusquellas *et al.,* 2024). The absence of transparency can create a negative environment for candidates where they need to make the decision regarding the acceptance or rejection to the job vacancy (Hunkenschroer & Luetge, 2022). Moreover, managers may face problems in confirming that AI systems are operationalized in accordance with legal and ethical rules but the AI algorithms are not always helpful for a non-technical employee (Powell, 2024). Here Privacy plays a significant role especially in the context of ethical consideration in the hiring process (Hunkenschroer & Kriebitz, 2023). In the case where the data is at risk, can violate the privacy of that individual (Hoxhaj *et al.,* 2023). In those situations, it is important for the organizations to be extra cautious in choosing the AI driven hiring patterns and also keep in mien the level of technology they are going to attempt to complete that task of recruitment (Vishwanath & Vaddepalli, 2023). Ethical AI in hiring (EAIH) requires that the welfare of an individual must be on priority so that the privacy of the user could be preserved by maintaining the integrity of the hiring as per the legal requirements.

OBJECTIVES OF THE RESEARCH STUDY

The research objectives of current bibliometric analysis are as follows:

1. To examine the publication scenario and framework for incorporating artificial intelligence in recruitment.
2. To investigate how the concept of AI evolved and used in recruitment.
3. To identify current trends and difficulties in AI recruitment procedures.

To achieve these research objectives of the study different techniques such as Network Analysis and Descriptive Analysis techniques are used. This study is divided into sections which covers different parts of the study. Research Methodology is covered in first section after which Data Analysis has been shown. Further sections provide a full description of the findings and at last research directions and conclusions are covered.

METHODOLOGY

Bibliometric Analysis has been utilized in this research (Cobo *et al.,* 2011). Bibliometric analysis is a method which is said to be a quantitative technique and basically in this academic literature has been analyzed by making the use of bibliographies to show, quantify and record research (Donthu *et al.,* 2021; Ellegaard, 2018). In every Bibliometric approach there are various challenges pertinent to that, and it can handle the scientific mapping of most common research problems and issues (Aria and Cuccurullo, 2017). Unlike Traditional reviews Bibliometric analysis makes use of statistical techniques while exploring the concept and to narrow down the differences (Bhandal *et al.,* 2022). Bibliometric approach collects data from existing literature and the approach allows for the collection of new data from literature reviews, which is able to go into the ongoing study (Donthu *et al.,* 2021). First, in this study we used the Scopus bibliographic resource search engine to generate a list of bibliographic references that needed to be reviewed using this PRISMA methodology (Preferred Reporting Items for the Systematic Reviews and Meta-Analyses), which is commonly used in this type of work. Second, the knowledge structures were examined using several bibliometric methods. Furthermore, conceptual frameworks emphasized important subjects and patterns, whilst social structures highlighted collaboration among authors and nations. (Solanki & Baroda, 2024). To perform bibliometric analysis, Biblioshiny application under R Studio has been used. The study included Bibliometric, an R statistical library (Aria & Cuccurullo, 2017; Team, 2010). The bibliometric R-Tool allows for more comprehensive bibliometric analysis by utilizing particular methodologies for both bibliometric and scientific metric quantitative research (Aria and Cuccurullo, 2017). R software is a comprehensive set of tools for data processing, computing, and graphical display. (Solanki &

Baroda, 2024). The approaches developed by Houghton *et al.* (2013) served as the foundation for the framework and organization of this study (Houghton *et al.*, 2013; Zakaria *et al.*, 2021).

Biblioshiny 4.1 has been used to perform the bibliometrics analysis, this is an open-source program which is from R Studio. Biblioshiny is most superior tool then other bibliometric tools because it offers a comprehensive set of statistical methods and visualizations that can perform analysis and conceptual mapping of the topic of study. (Gutiérrez- Salcedo *et al.*, 2018; Veloutsou & Liao, 2023). The R package Biblioshiny is made available to everyone. This study was conducted in two stages: first, the Scopus database search contributions were identified, secondly, the bibliometrix files under bibliometrix package were used to perform a bibliometric analysis.

Table 1: Research Framework

Step 1. Investigation Scope A bibliometric analysis of A.I on Talant Acquisition covering from 2000 to 2024.	
Step 2: Selecting a database SCOPUS Database	
Step 3. Selection of Documents	
1st selection criteria TITLE-ABSTRACT-KEYWORD PLUS Your Query: ((TITLE-ABS-KEY (("artificial intelligence" AND "Talent acquisition") OR ("artificial intelligence" AND "Recruitment") OR ("artificial intelligence" AND "Hiring")) OR TITLE-ABS-KEY (("AI" AND "Talent acquisition") OR ("AI" AND "Recruitment") OR (" AI" AND "Hiring"))) (Result-2024 documents)	Phase I-:Selection of Documents
2nd selection criteria Year Range 2000–2024 (Result:1952 documents)	
3rd selection criteria SUBJECT AREA: Business, Management & Accounting, Arts & Humanities (Result:388 documents)	
4th selection criteria DOCUMENTS TYPE: Research Articles (Result:195 documents)	
5th selection criteria PUBLICATION STAGE: Final published papers (Result-:82 documents)	
6th selection criteria SOURCE TYPE: Journal publications (Result:180 documents)	
7th selection criteria LANGUAGE: English. (Result:168 documents)	
Final Dataset – A total of 168 documents exported as CSV file	PhaseII:Bibliometric Analysis
Step 4. Processing of Selected Documents RSTUDIO'S BIBLIOSHINY TOOL	
Step 5. Bibliometric Analysis and Inference of Results	

Source: Authors' Compilation

This bibliometric study was chosen to be performed based on Scopus, since it is one of the largest databases of peer-reviewed literature that is curated and has a broader multidisciplinary coverage as compared to Web of Science. Its rich metadata index and excellent capacity to track citation makes it very accurate in longitudinal trend analysis.

Phase I- Finalized Number of Documents

In the above Table 1 we discussed few steps of research framework. First, we have explained the scope of the research area: AI on Talent Acquisition research in the time period 2000-2024. Secondly, the studies were chosen from SCOPUS which is one of a popular research platform. SCOPUS was chosen because it can be considered as a comprehensive source and one of the primary bibliographic databases. (Zhu & Liu, 2020).

In phase I the search for the selection of documents were prepared by keeping the following keywords in our query: ((TITLE-ABS-KEY (("artificial intelligence" AND "Talent acquisition") OR ("artificial intelligence" AND "Recruitment") OR ("artificial intelligence" AND "Hiring")) putting

them as the main line of the search box. Further, these keywords are related with some of the additional keywords: OR (TITLE-ABS-KEY (("AI" AND "Talent acquisition") OR ("AI" AND "Recruitment") OR ("AI" AND "Hiring")) in the second line search. Above extra terms were used to show their characteristics of Artificial Intelligence research from Talent Acquisition with respective perspectives.

Terms “Recruitment”, “Talent Acquisition”, “AI”, “Hiring”, combining these main and additional keywords, the boolen scholarly publications which cover a wide range of subjects linked to Artificial intelligence with recruitment from Scopus database. By using the artificial intelligence tools and techniques, the time taking process can be made faster about 50 per cent because it helps in activities performance in an easy and efficient manner (Raji *et al.*, 2024).

There were 2024 documents found in the first search without any filtering. The number of papers was reduced to 1952 by using the filtering option "years of publication" (2000-2024) to refine the results. As we all know that the AI is using most in Business, Management area. So, after using next filter of subject area- “Business, Management & Accounting, Arts & Humanities” the remaining number of articles is 388 articles. Further to examine the bibliometric analysis; the finalized list of articles was chosen by following a rigorous process under which the research papers were being followed through an inclusion and exclusion criteria. This is one of the most popular methods which helps in providing the final list of chosen articles. On these finally selected, further process is performed.

Moreover, we restricted our search results by choosing the publication stage filter as only “Final”. After this filter the number of remaining articles was 182. The next search filter is source type in which we choose only Journal articles for our analysis. Then the final documents were cut down to 180 after following the “inclusion and exclusion criteria”. This criterion was used for filtering the following articles are presented. The last step is to choose language English. The above steps help the researchers narrow down the initial pool of articles and to select those that aligns with the research objectives. After identifying these steps resulted as number 168, the most relevant articles, which were exported as CSV file format for further analysis.

Phase II- Bibliometric Analysis

While performing the bibliometric analysis, performance analysis and scientific mapping analysis are the two main. The method is more effective since it combines mathematics and statistical analysis. The literature can help identify accurate and precise patterns. (Roblek *et al.,* 2022) According to the study, qualitative methods like interviews and drawing inferences can be employed for data analysis. Therefore, bibliometric analysis is based on the scientific map method. The tool uses a general representation and domain analysis process to analyses scientific groups and research areas as networks. (Bragge *et al.,* 2019) analyzed three decades of management research publications to identify research clusters and intellectual structures (Cortés-Sanchez, 2020). The study highlights the significant advances in business, management, and accounting studies during the past century. The major contributions are examined in the analytical performance. The annual number of publications, the most cited articles, the most of the cited journals and the authors, association trends, high-contributing institutions, and nations are a few performance analysis metrics (Donthu *et al.,* 2021). This analysis was conducted in R studio’s bibloshiny software for analyzing and inferences of results. The results of the above data analysis is to be introduced below in the results section.

DATA ANALYSIS

Bibliometric Analysis

There were two main approaches used in the data analysis.

1. Descriptive Analysis
2. Network Analysis

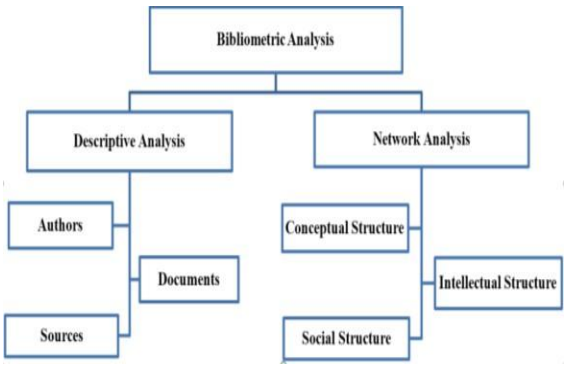

Figure 1: Bibliometric Analysis - Hierarchy

Source: Authors’ Compilation

Descriptive Analysis

While performing the bibliometric data analysis, the following three basis are used, first one is the sources, second is the authors, and the third is analysis on the basis of documents. This section of the paper is mostly concerned with descriptive analysis. The broad analysis encompassed numerous dimensions. It assisted the researcher in determining the knowledge structures that would enable additional analysis (Nusair *et al.,* 2019).

Dataset

Table 2: Brief Summary of Dataset

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2000:2024
Sources (Journals, Books, etc)	129
Documents	168
Annual Growth Rate %	19.07
Document Average Age	2.9
Average citations per doc	28.55
References	10787
DOCUMENT CONTENTS	
Keywords Plus (ID)	504
Author's Keywords (DE)	609
AUTHORS	
Authors	469
Authors of single-authored docs	34
AUTHORS COLLABORATION	
Single-authored docs	35
Co-Authors per Doc	2.89
International co-authorships %	23.21
DOCUMENT TYPES	
article	168

Source: Biblioshiny Software

A brief summary of the data is taken in Table 2. The analysis provides an overview of the dimensions examined. This report summarizes key criteria from 129 sources between 2000 and 2024. The bibliometric data set included 168 documents founded by a stepwise search query on the Scopus database. The data set's annual growth rate of 19.07% reflects the research field's development all over time. The average documents age is 2.9 years, indicating the recent focus on the data set. The average of 28.55 citations per documents highlights the intellectual impact of the collected works. The data set has 469 authors, including 34 who contributed to single-authored publications. Every document has an average of 2.89 co-authors, and 23.21% of collaborations are international, highlighting the research network's global scope. This was a positive sign that researchers were working together effectively.

Three-Field Plots

Figure 2 present three-field plots help in understanding how three sets of information are related to each other. During the study, the percentage of selected items was identified using three-field plots. In the figure, items appear next to rectangles, and the height of each rectangle represents the strength of relationships between components in the same row (Phoong *et al.,* 2022).

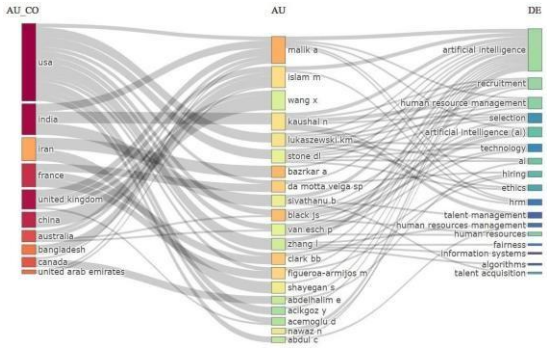

Figure 2: Three-Field Plot

Source: Biblioshiny Software

The plot shows how authors, countries, and keywords are connected. The ten most popular artificial intelligence keywords are shown on the right to identify research hotspots. The left side shows the country with the highest number of AI publications, while the middle shows the top ten authors working with these keywords**.** The outcome of the analysis designates that the keywords "artificial intelligence". "recruitment", "human resource management" are linked with authors and top most countries.

Annual Scientific Production

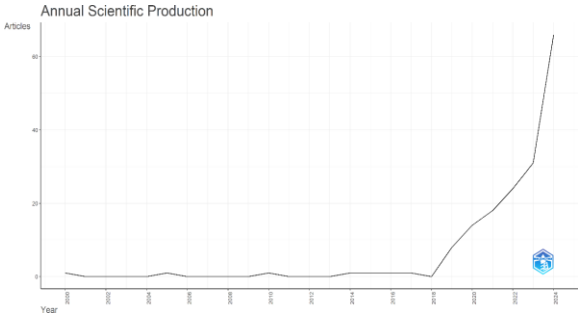

Figure 3: Annual Scientific Production

Source: Biblioshiny Software

An increase in the annual scientific production in the fields of artificial intelligence and recruitment (refer figure 3). The author's research of AI and recruitment trends from 2000-2024 provides a good overview. This graph shows a partial stagnation between 2000 and 2024. Since 2018, there has been a significant increase in interest in AI and recruitment. Post 2018, this field has witnessed a rapid growth in the number of publications. The spike during the year(s) 2018 and 2024 could be related to the beginning of a global epidemic. Organizations started using effective Human Resource (HR) practices (Saxena *et al.,* 2021). The study highlighted the hurdles in implementing and accepting HR Analytics in organizations. According to a study by (Vitak and Zimmer, 2023), the future of work involves utilizing technology to support work-from-home practices.

Citations

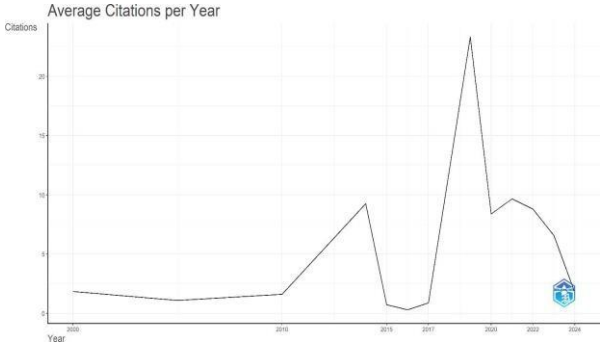

Figure 4: Annual Coverage of Article Citations

Source: Biblioshiny Software

Figure 4 illustrates changing trend in terms of the concept. This graph indicates the average number of times a research paper gets cited each year. The time period taken by us is between 2000 to 2024. For the first decade, citations were low and stable. The field seems to be extremely grounded and changing. Citations started increasing in about 2015, indicating that the research was becoming more popular. A huge spike happened about 2020, most likely as a result of a significant publication or event. However, citations fell, probably because newer research appeared or the topic's attractiveness declined. The context and aspects shaping research's impact and relevance might change throughout time.

Most Relevant Sources

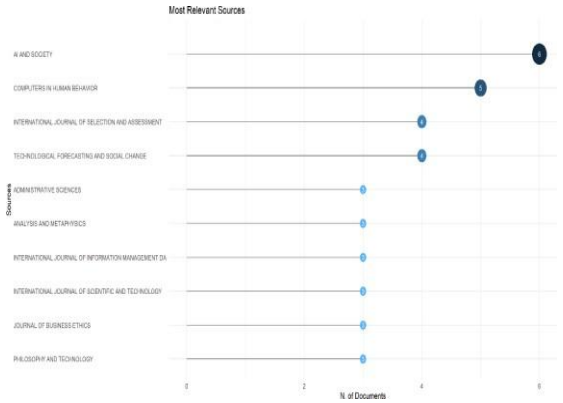

Figure 5: Top 10 Cited Sources

Source: Biblioshiny Software

Figure 5 shows the most relevant sources. This chart ranks the most relevant sources based on their document contribution. "AI and Society" leads with 6 documents, more than any other source, indicating a considerable focus on the subject. "Computers in Human Behaviour" ranks second, with 5 documents. Several sources, including "International Journal of Selection and Assessment" and "Technological Forecasting and Social Change" provided 4 documents a piece. A broader group, which included "Administrative Sciences" and "Philosophy and Technology" each submitted 3 documents. The different circle sizes visually depict the number of documents, emphasizing "AI and Society's" importance. This visualisation makes it easier to discover key sources for additional investigation.

Sources' Local Impact

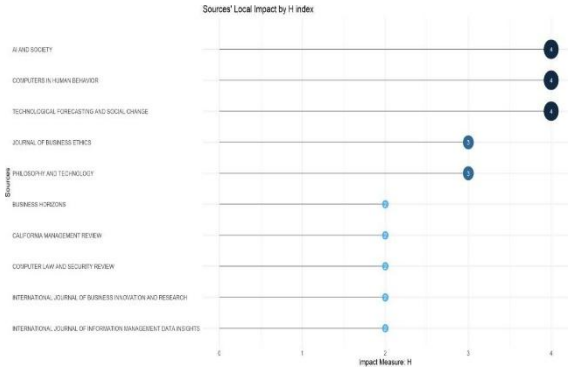

Figure 6: Sources' Local Impact by H-index

Source: Biblioshiny Software

Figure 6 H-index is the index that aims to measure the accuracy and impact of published work by researchers. (Hirsch, 2005) developed the h-index statistic to assess academic accomplishment based on a single value derived from the number of publications and citations Below graph shows the effect of various factors using a metric known as the "H index." In the field of artificial intelligence and talent acquisition as determined by H- index. The greater the number, the more trustworthy the source. "AI and Society" and "Computers in Human Behaviour" and "technological forecasting and social change" have the highest influence, having a score of four. "Journal of Business Ethics" and "Philosophy and Technology" come next, both with a score of 3. The remaining sources like business horizons, California management review etc. get a score of two, indicating moderate influence. Basically, this chart shows you which sources are regarded as the most relevant and influential in this field of study.

Sources' Production over Time

Figure 7 provides a timeline of research output for significant sources on Artificial intelligence and recruitment and hiring domains. Noteworthy sources include "Administrative sciences" and "Computers in human behaviour" Both show consistent contributions to the literature, an upward publication trend from 2000 to 2024, and h-index values of 6 and 5, respectively. "Philosophy and Technology" and "International Journal of

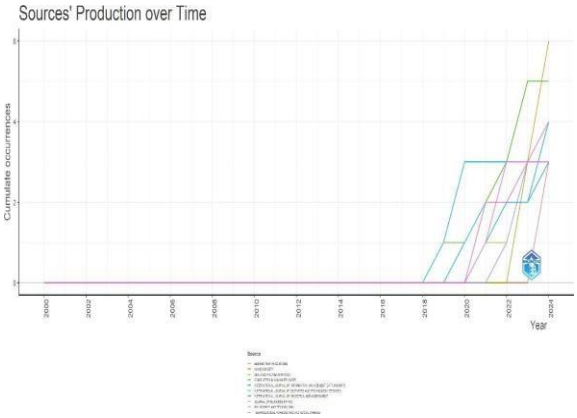

Figure 7: Sources' Production over Time

Source: Biblioshiny Software

Selection and Management" each also show steady growth, reaching an h-index of 4. And remaining journals reaching h- index of 3. This summary focusses on significant individuals influencing discusses regarding artificial intelligence and talent acquisition, providing insight into the impact of local authors.

Authors

Over the given years, the scholarly contributions of AI and Society and Computers in Human Behaviour and technological forecasting and social change been notable, whereas other sources such as Journal of Business Ethics and Philosophy and Technology demonstrate varying level of impact.

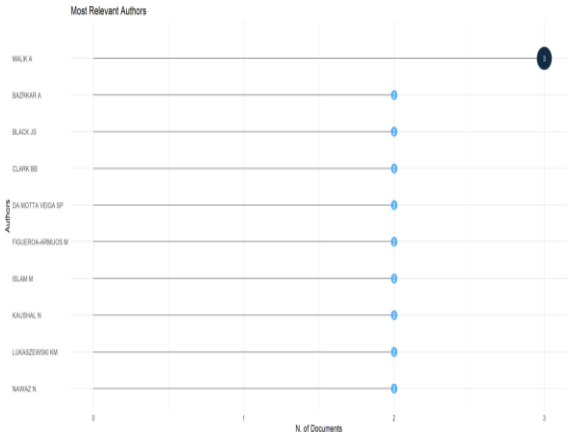

Figure 8: Most Relevant Authors

Source: Biblioshiny Software

Figure 8 represents the top 10 most relevant authors. In the terms of number of total publications, Malik A is the most productive author having 3 documents, followed by Bazrkar A, Black JS, Clark BB, DA Motta Veigs SP, Figueroa-Armijos M etc. having the number of 2 documents each. The authors' and their contributions to the progress of knowledge in this field are appreciated.

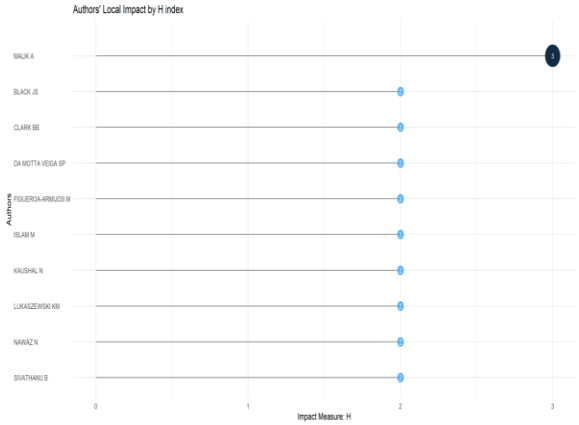

Figure 9: Authors' Local Impact by H index

Source: Biblioshiny Software

In figure 9, H index is represented, this graphic ranks authors in order of their local impact. Malik A leads with an H index of 3, reflecting the highest level of impact among the listed authors. Followed by Malik A are numerous authors Black IS, Clark AR, DA Motta Veiga SP, Figueroa Armijos M, Islam M, Kaushal N, Lukaszewski KM, Nawaz N, and Sivathanub they all are having H index of 2. This suggests that, while they have had an impact in their field, it is smaller than that of Malik A. The graphic representation clearly shows the difference in impact between Malik A and the other authors, allowing for a quick assessment of relative influence among them. The H index, as applied here, assesses both the number of publications and the number of citations they have received.

Country Wise Contribution

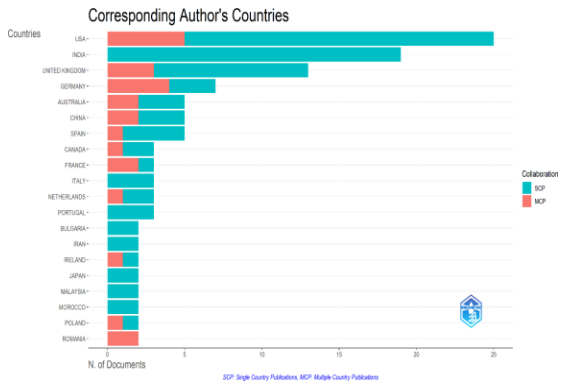

Figure 10: Corresponding Authors' Countries

Source: Biblioshiny Software

Figure 10 presenting the corresponding Author's countries. These horizontal bars show the number of publications on a topic, likely related to

Artificial intelligence in talent acquisition and hiring originating from the different countries. The bar length represents the number of documents, with the scale at the bottom indicating the range of top 10 countries. Each bar is separated into two colors: green (SCP) and pink (MCP). In this graph, the USA has the most publications, followed by India and the United Kingdom. Several countries, like Germany, Australia, China, and others, have a small but significant number of publications. The color split indicates the proportion of single and multi-country cooperation in each country's output.

Table 3: Countries' Scientific Production

Country	Frequency
USA	89
India	61
UK	37
Germany	25
China	23
France	16
Italy	16
Spain	13
Portugal	12
Australia	11

Source: Biblioshiny Software

Table 3 illustrates the frequency or count of a specific measure across multiple countries. The United States leads with the greatest frequency of 89, indicating the largest count in this category. India follows with 61, while the United Kingdom has 37. Germany and China have counts of 25 and 23, respectively. France and Italy share a total of 16. Spain has 13, Portugal has 12, while Australia has the lowest total of 11. This data clearly depicts the distribution of the measured metric among these countries, highlighting the USA's great dominance and the very minor contributions of the other listed countries.

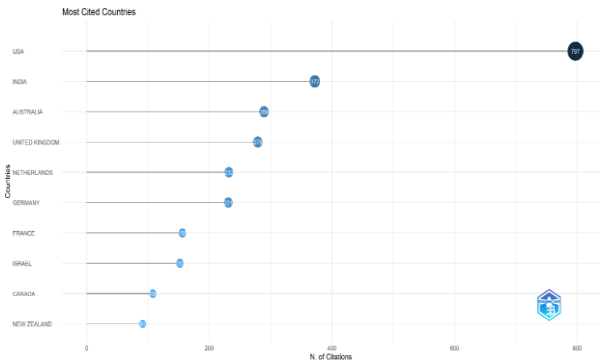

Figure 11: Most Cited Countries

Source: Biblioshiny Software

Figure 11 presents the "Most Cited Countries" and the number of citations their work has achieved. The countries are displayed vertically, while the horizontal axis shows the number of citations, which ranges from 0 to 800. Each country's citation count is shown by a blue circle on the horizontal axis, with the precise number printed inside. The United States leads by a large margin, with 797 citations, greatly exceeding the citation counts of all other countries included India ranks second with 372 citations, followed by Australia with 289. The United Kingdom has 279 citations, and the Netherlands has 232. Germany follows with 231 citations. France and Israel have 156 and 152 citations, respectively. Canada has 108 citations, whereas New Zealand has the fewest citations of the countries listed 91. The chart clearly shows the significant gap in citation counts between the United States and the rest of the world, emphasizing its dominance in terms of research effect. The graphic depiction allows for quick and easy comparisons of citation influence across nations. Additionally, it can help identify influential persons in the domain's conversation and knowledge base. Analyzing contributions from different countries can provide insights into cultural, political, and economic factors that contributed to the field's development and current status.

Documents

Most Cited documents Figure 12 displays the Most Global Cited Documents, ranked by the number of citations they've received. In this figure two documents stand out. The first paper by Tambe, Cappelli, and Yakubovich (2019) in the California management review leads with impressive 575 citations, which indicates everlasting impact. Second significant works done by Huang M-H (2019) paper in the California Management Review also done their work efficiently and leads with 305 citations. Following these two highly cited documents, there's a substantial drop in citation count. "Van Esch P. (2019), Computer in Human Behavior" and "Busuioc M (2021), Public Administrative Review" have 214 and 197 citations respectively. The remaining documents, including "Van Den Broek E. (2021), Management Information System" with 197 and others, have citation counts clustered below 200. The set allows researchers to identify important contributions that affect the subject at hand, as well as provide insight into its historical significance and continuing relevance in the field.

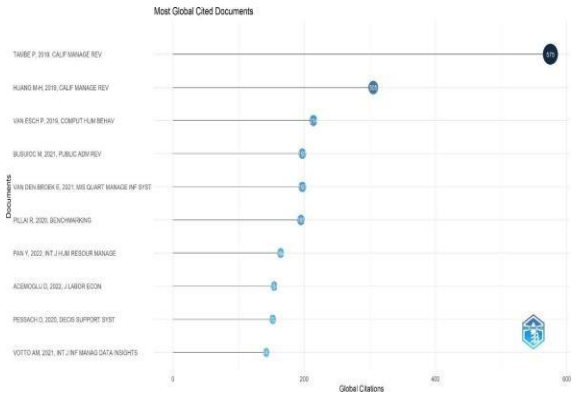

Figure 12: Most Cited Documents

Source: Biblioshiny Software

Keywords

Figure 13 shows word cloud by highlighting the most commonly recurring terms. The Word Cloud displays and represents the frequency of keywords. The terms stand out on the word cloud. The value of a word indicates its significance. In this, "artificial intelligence" is the leading topic, appearing 30 times occurrences in the word cloud underscoring in central role in research discussions.

Figure 13: Word Dynamics

Source: Biblioshiny Software

The word cloud also emphasizes "machine learning," "employment," and "fairness," which are indirectly reflected in the chart, highlighting worries about AI's impact on hiring. The combination of "male" and "female" indicates gender-related issues in recruitment. Overall, this word cloud highlights AI's impact on hiring, mainly decision-making, fairness, and automation in human resource management. Experts are getting more interested in machine learning and recruitment, adopting AI. E- Recruitment is among the top ten most relevant words (Aydin and Turan, 2023; Pandey *et al.*, 2020; Wang *et al.*, 2021).

Trend Topics

Figure 14 presents the most trend topics related to artificial intelligence (AI) domain over time, with a focus on recruitment and talent acquisition. The most popular topics include "artificial intelligence," "decision making," and "recruitment." Studies by Aydın and Turan (2023) supports the link between AI and recruiting trends. Recent studies by Kaushal *et al.* (2023) and Kaushal & Ghalawat (2023) have established the study focus for AI's function in HR. Notably “Artificial intelligence” is the most used and common, which appear 30 times and maintaining consistency from 2021 to 2023. The final keyword “decision making” is also remarkable with 10 occurrences expanding from 2022 to 2023. There was a significant increase in research focused on the "recruitment process" in the year 2022 and 2023. Keywords like "human resource management," "machine learning," and "hiring" remain relevant throughout many timeframes. Overall, the graph highlights the evolving landscape of AI research and its increasing formation into human resource practices

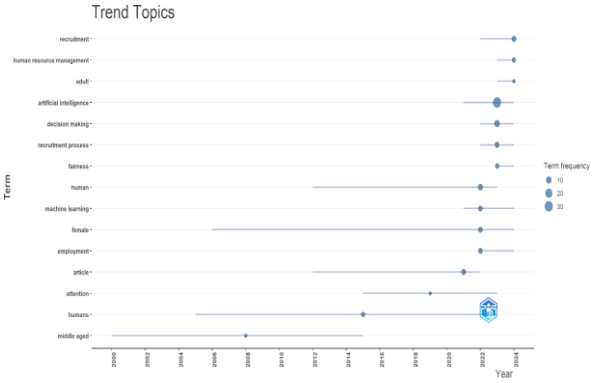

Figure 14: Trend Topics

Source: Biblioshiny Software

DATA VISUALIZATION

There has been rising demand for artificial intelligence and recruitment. The current section of the study explores the evolution of the domain's topics. Data visualization is a quantitative tool for identifying clusters, occurrences, and relationships among different domains of study. The technique analyses texts, authors, and keywords to identify network links. The statistical analysis generated a map that indicated network connections. As represented in Figure 1, this network analysis results in three types of knowledge frameworks. The three types of structures are social structure, conceptual structure, and intellectual structure. Below section shows the field's thematic

progression. Data visualization uses network analysis to statistically examine clusters, occurrences, relationships, and citations. Network analysis provides quantitative assessments of cluster formation, instances, connections, link strength, and citations (Low & Siegel, 2020). Networks are made up of nodes connected to each other. Statistical study of generated maps shows several network metrics (Aria and Cuccurullo, 2017). Network analysis is used in scientific mapping to generate the conceptual and the social knowledge models (Figure 1).

Conceptual Analysis

The 'conceptual framework' displays the association of the three T's (topics, themes, and trends). Figure 15 shows a co-occurrence networks diagram. It is also called co-word analysis. The Co-occurrence network is shown by four separate-colored nodes. Artificial intelligence in red color; human resource in green color; artificial intelligence system in blue color and human resource management in purple color. The contents of the articles are extracted and analyzed. Topics like AI, technology, block chain, and algorithms appear to be related. The red nodes represent artificial intelligence. Human resources are a close cousin to artificial intelligence. They are deeply connected to artificial intelligence. The study focusses on a frequently used notion, phrase, or topic in the network (Li *et al.*, 2018).

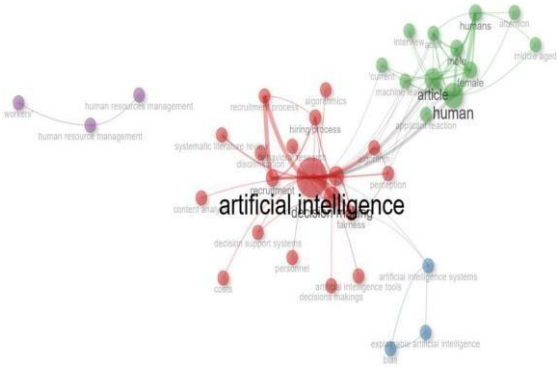

Figure 15: Co-Occurrence Network

Source: Biblioshiny Software

Thematic Map

A thematic map generates a two-dimensional visual representation of typological themes (Cobo *et al.*, 2011). Co-word analysis identifies authors' keyword clusters and creates themes within the explored subject. On a two-dimensional graph, topics can be classified into four quadrants based on their density and centrality. Each subject is represented by its own bubble on the map. Figure 16 shows that the map is based on two axes, with themes' centrality and density determining their location on the two-dimensional network. A „Thematic Map' is drawn on two dimensions with typological themes. Keyword clusters are found with references taken from the co-occurrence and co-word analysis. This helps in the next step of producing themes in the study domain. As seen in Figure 16, the mapping is built on two axes. The centrality and density of the themes determine its place on the two-dimensional graph. A bubble on the thematic map denotes the theme. According to (Jesus *et al.*, 2011) the Thematic map is divided into four quadrants: upper right quadrant for motor themes, lower right quadrant for basic themes, lower left quadrant for emerging or declining themes, and upper right quadrant for specialty themes. The figure shows a strong correlation between AI and recruitment. The cluster centered around human article female, humans' attention middle aged emerges as a primary motor theme, indicating its role as a mature pillar in the current literature.

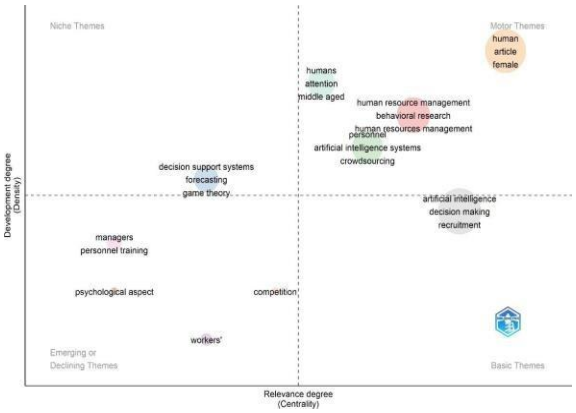

Figure 16: Thematic Map

Source: Biblioshiny Software

Intellectual Structure

The intellectual structure shows the author's impact on the scientific community. The relationship between authors and countries are examined. The partnership and cooperation among research organizations and their links with different universities (Ingale & Paluri, 2020). Pampouktsi *et al.* 2021 developed a 3-in-1 framework for machine learning-based selection and positioning. The system efficiently picks meritocratic persons and positions, either horizontally within divisions or vertically in leadership roles.

Tree Map

Figure 17 shows the tree map of globalization of significant subjects of artificial intelligence (AI) in recruitment and human resource management. Each rectangle represents a topic, and its size indicates its importance or frequency in the collection. Top four terms are "Artificial intelligence" is the most popular topic (24%), followed by "recruitment" (8%), "human resource management" (6%), and "machine learning" (4%). Other major topics include "hiring," "bias," "ethics," "selection," and "technology," indicating concerns about AI's impact on HR operations. Most authors and scholars are researching the relationship between AI, machine learning, and recruitment (Kettler & Lehnervp, 2019). The essay suggests that newer models are evolving to reflect contemporary social trends. Artificial intelligence has led to the development of humanistic management and talent recruiting strategies.

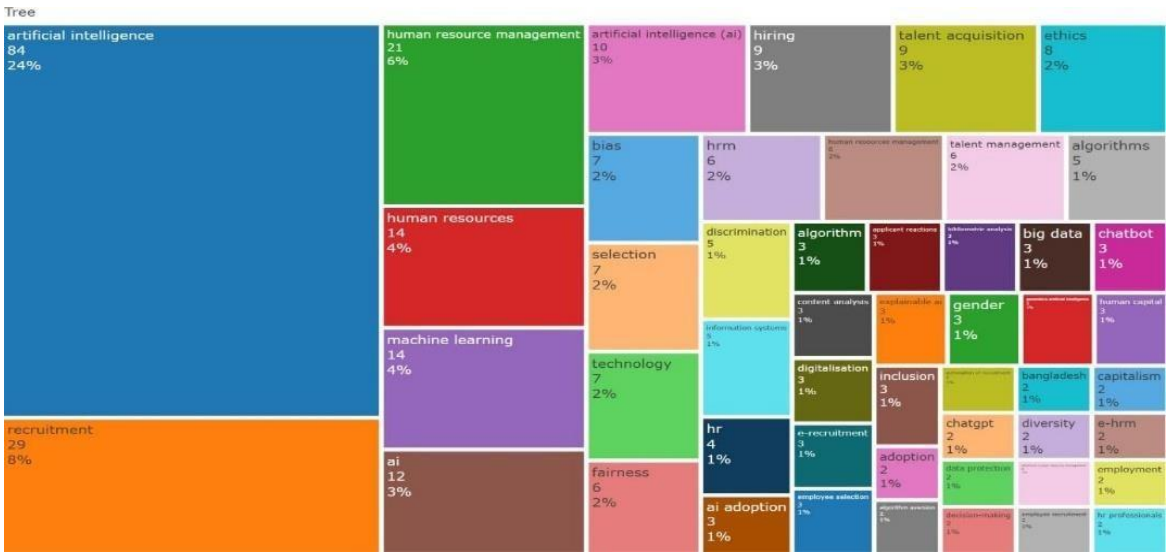

Figure 17: Tree Map

Source: Biblioshiny Software

Social Structure

Social network Analysis facilitates the development of interrelationships within the research domain. Scholars, authors, and sources of publication are referred to as 'nodes' in a social network. The interconnection of these nodes is indicated by their set. The network dynamics reveals the connections that exist between different areas (Low & Siegel, 2020).

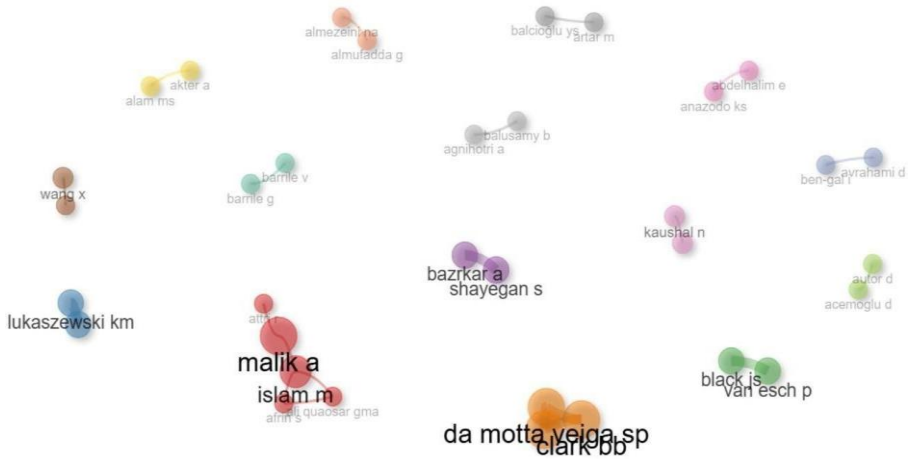

Figure 18: Geographical Collaboration Network of Authors

Source: Biblioshiny Software

In Figure 18 the geographical collaboration network shows research collaborations across various locations. Each circle represents an author, and the color indicates their connection. Lines connecting circles represent collaborative work.

Distinct color groups identify authors focused by geographical area, while connecting lines highlight partnerships between academics in various fields. Authors such as "Malik A," "Islam M," "DA Motta Veiga SP," "Clark, BB," and "Van Esch, P" appear to be participating in worldwide collaborations that connect diverse research communities. The graph shows the geographical distribution of researchers and the interconnection of their work, demonstrating international collaboration in research.

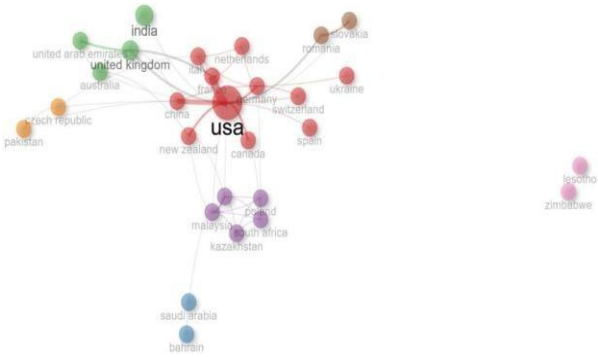

Figure 19: Geographical Collaboration Network of Countries

Source: Biblioshiny Software

In Figure 19 the author indicates the geographical collaboration and distribution of around 45 countries. The graph shows a worldwide collaboration network, with the USA being the most connected. Green shows groupings of closely collaborating countries, whereas purple represents similar clusters. Lesotho and Zimbabwe appear to be isolated, indicating a lack of international engagement.

CONCLUSION

The current paper has undertaken the bibliometric analysis which is based upon Artificial Intelligence (AI) technologies mainly in organizations during Hiring and Recruitment activities. This study provides an overview of research trends, key authors, and emerging challenges being observed in the area of AI-driven talent acquisition. In the present paper, the period from 2000 to 2024 has been referred. This study is based upon 168 research articles which were mainly extracted from the database of Scopus. But to analyse the data further, R Biblioshiny was taken under consideration. The study reflected a significant annual growth rate of 19.07%, which is an indication of increasing scholarly interest in AI-based recruitment processes.

While analyzing the results of this study it has been found out that USA (89 papers, 797 citations), India (61 papers, 372 citations), and the UK (37 papers, 279 citations) emerged as the most prominent authors. Another point in this regard claims that the USA had the highest citation impact among all these. But while the documents were observed further (Tambe, Cappelli, & Yakubovich, 2019) came out to be the most cited author with 575 citations, whereas Huang M-H (2019) was having 305 citations afterwards. The main focus of that study could be checked where the study focuses upon the transformative role of AI especially in hiring processes. Some more authors were also found influential in this regard where Malik A having H index-3; Bazrkar A and Black J S with H index- 2. But when the key journals were analyzed, the journal having the highest publication score was AI & Society with six publications and H-index: 4; another journal in the name of Computers in Human Behavior with five publications and H-index: 3, being followed by Computers in Human Behavior (5 publications, H-index: 4), and Technological Forecasting and Social Change (4 publications, H-index: 4). These research studies have contributed highly to the AI recruitment research area. While going deep into the bibliometric analysis, the co-occurrence network analysis is one of the main technique used. In the current paper, this study reveals that the keywords used in the present paper most frequently include “Artificial Intelligence” (occurred 30 times), “Decision-Making” (occurred 10 times), and “Recruitment Process” (occurred 7 times). This phenomenon demonstrates that the influence of artificial intelligence is increasing in hiring strategies. The geographical collaboration network highlights strong international partnerships, particularly among the USA, UK, and India, signifying the global nature of AI-driven recruitment research.

Moreover, the incremental usage of AI to analyze the digital awareness of users where the profiles of social media and other behavioral traits are being studied. In the same way, the most popular countries are being examined through their citation

rate further confirms the dominance of USA in AI recruitment research, followed by Germany, China, and Australia show increasing engagement.

The Collaboration between academia and industry is needed to induce the best possible practices for ethical AI governance in different organizations. This is especially needed in recruitment because recruitment is the first step to interact with the organization. As AI continues to transform talent acquisition, organizations must balance their technological upgradations with ethical standards to maintain transparency and fairness. The current study provides valuable insights to HR professionals, policymakers, and researchers so that the future of AI-driven recruitment could be flourished.

RESEARCH LIMITATIONS

Despite the broad scope of the bibliometric analysis used in this work, some limitations were identified. First, the study was limited to publications indexed in the SCOPUS database, which, while vast, may not have included all relevant material, particularly those published in non-English languages or in lesser-known journals. Second, the selection criteria were limited to research articles, possibly disregarding major contributions from industry reports, white papers, and grey literature that could provide further context and insights into the practical implications of AI in talent acquisition. Moreover, the investigation relied mostly on quantitative methodologies, which may not fully capture the qualitative nuances of how AI is viewed and deployed in various organizational contexts. Future research should use a broader range of sources and approaches to have a more complete picture of AI's impact in talent acquisition.

RECOMMENDATIONS FOR FUTURE RESEARCH

To enhance the understanding of AI in recruitment, the report proposes numerous future research topics. In the Future research work should look into the developing ethical considerations of using AI tools in talent recruiting, namely prejudice and fairness in algorithmic decision-making. Furthermore, researchers could look into the long-term effects of AI on job seekers' experiences and outcomes in the recruitment process.

Collaborative research including both academics and industry practitioners could result in the establishment of best practices for incorporating AI in recruiting, as well as addressing the challenges that HR professionals encounter throughout this shift. Finally, ongoing research initiatives should strive to produce a balanced narrative that shows both the potential benefits and the challenges brought by AI in the changing landscape of talent acquisition.

REFERENCES

Abraham, R., Paripoornam, R., & Sharma, G. (2025). The role of artificial intelligence in recruitment and talent acquisition-An empirical study. *Journal of Informatics Education and Research*, 5(1), 400-408.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959-975.

Aydın, E., & Turan, M. (2023). An AI-based shortlisting model for sustainability of human resource management. *Sustainability*, 15(3), 2737.

Bankins, S., & Formosa, P. (2023). The ethical implications of artificial intelligence (AI) for meaningful work. *Journal of Business Ethics*, 185(4), 725-740.

Bhandal, R., Meriton, R., Kavanagh, R. E., & Brown, A. (2022). The application of digital twin technology in operations and supply chain management: A bibliometric review. *Supply Chain Management: An International Journal*, 27(2), 182-206.

Black, J. S., & Van Esch, P. (2020). AI-enabled recruiting: What is it and how should a manager use it? *Business Horizons*, 63(2), 215-226.

Bragge, J., Kauppi, K., Ahola, T., Aminoff, A., Kaipia, R., & Tanskanen, K. (2019). Unveiling the intellectual structure and evolution of external resource management research: Insights from a bibliometric study. *Journal of Business Research*, 97, 141-159.

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the Fuzzy Sets Theory field. *Journal of Informetrics*, 5(1), 146-166.

Cortés-Sánchez, J. D. (2020). A bibliometric outlook of the most cited documents in business, management and accounting in Ibero-America. *European Research on Management and Business Economics*, 26(1), 1-8.

Costas, R., & Bordons, M. (2007). The h-index: Advantages, limitations and its relation with other bibliometric indicators at the micro level. *Journal of Informetrics*, 1(3), 193-203.

Derviş, H. (2019). Bibliometric analysis using bibliometrix an R package. *Journal of Scientometric Research*, 8(3), 156-160.

Dhamija, P. (2012). E-recruitment: A roadmap towards e-human resource management. *Researchers World*, 3(3), 33.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285-296.

Ellegaard, O. (2018). The application of bibliometric analysis: disciplinary and user aspects. *Scientometrics*, 116(1), 181-202.

Ghazzawi, K., & Accoumeh, A. (2014). Critical success factors of the e-recruitment system. *Journal of Human Resources Management and Labor Studies*, 2(2), 159-170.

Gutiérrez-Salcedo, M., Martínez, M. Á., Moral-Munoz, J. A., Herrera-Viedma, E., & Cobo, M. J. (2018). Some bibliometric procedures for analyzing and evaluating research fields. *Applied Intelligence*, 48(5), 1275-1287.

Hirsh, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences*, 102(46), 16569-16572.

Hmoud, B. I. F., & Várallyai, L. (2019). Will artificial intelligence take over human resources recruitment and selection? *Network Intelligence Studies*, 7(13), 21-30.

Horodyski, P. (2023). Recruiter's perception of artificial intelligence (AI)-based tools in recruitment. *Computers in Human Behavior Reports*, 10, 100298.

Houghton, V. J., Bower, V. M., & Chant, D. C. (2013). Is an increase in skin temperature predictive of neuropathic foot ulceration in people with diabetes? A systematic review and meta-analysis. *Journal of Foot and Ankle Research*, 6(1), 31.

Hoxhaj, O., Halilaj, B., & Harizi, A. (2023). Ethical implications and human rights violations in the age of artificial intelligence. *Balkan Social Science Review*, 22(22), 153-171.

Huang, J. H., Duan, X. Y., He, F. F., Wang, G. J., & Hu, X. Y. (2021). A historical review and bibliometric analysis of research on weak measurement research over the past decades based on Biblioshiny .*arXiv*.

Hunkenschroer, A. L., & Kriebitz, A. (2023). Is AI recruiting (un)ethical? A human rights perspective on the use of AI for hiring. *AI and Ethics*, 3(1), 199-213.

Hunkenschroer, A. L., & Luetge, C. (2022). Ethics of AI-enabled recruiting and selection: A review and research agenda. *Journal of Business Ethics*, 178(4), 977-1007.

Ingale, K. K., & Paluri, R. A. (2022). Financial literacy and financial behaviour: A bibliometric analysis. *Review of Behavioral Finance*, 14(1), 130-154.

Kassir, S., Baker, L., Dolphin, J., & Polli, F. (2023). AI for hiring in context: A perspective on overcoming the unique challenges of employment research to mitigate disparate impact. *AI and Ethics*, 3(3), 845-868.

Kaushal, N., & Ghalawat, S. (2023). Research perspective of artificial intelligence and HRM: A bibliometric study. *International Journal of Business Innovation and Research*, 31(2), 168-196.

Kaushal, N., Kaurav, R. P. S., Sivathanu, B., & Kaushik, N. (2023). Artificial intelligence and HRM: Identifying future research agenda using systematic literature review and bibliometric analysis. *Management Review Quarterly*, 73(2), 455-493.

Koivunen, N., Viitala, R., & Ekman, K. (2024). How managers experience downsizing: Navigating among professional, loyal, empathic, and critical positions. *Journal of Change Management*, 24(4), 301-324.

Li, T., Bai, J., Yang, X., Liu, Q., & Chen, Y. (2018). Co-occurrence network of high -frequency words in the bioinformatics literature: Structural characteristics and evolution. *Applied Sciences*, 8(10), Article 1994.

Low, M. P., & Siegel, D. (2020). A bibliometric analysis of employee-centred corporate social responsibility research in the 2000s. *Social Responsibility Journal*, 16(5), 691-717.

Nusair, K., Butt, I., & Nikhashemi, S. R. (2019). A bibliometric analysis of social media in hospitality and tourism research. *International Journal of Contemporary Hospitality Management*, 31(7), 2691-2719.

Pampouktsi, P., Kermanidis, K. L., & Avlonitis, M. (2021). A 3-in-1 framework for human resources' selection and positioning based on machine learning tools. *International Journal of Data Analysis Techniques and Strategies*, 13(4), 317-335.

Pandey, R., Chitranshi, J., Nagendra, A., & Lawande, N. (2020). Human resource practices in Indian Army and suggest implementation of artificial intelligence for HRM. *Training*, 84(1), 5.

Paramita, D., Okwir, S., & Nuur, C. (2024). Artificial intelligence in talent acquisition: Exploring organisational and operational dimensions. *International Journal of Organizational Analysis*, 32(11), 108-131.

Phoong, S. Y., Khek, S. L., & Phoong, S. W. (2022). The bibliometric analysis on finite mixture model. *SAGE Open*, 12(2), 2158 2440221101039.

Powell, J. R. (2024). Human resource professionals' perceptions of trust in explainable artificial intelligence hiring software (Doctoral Dissertation, National University).

Rąb-Kettler, K., & Lehnervp, B. (2019). Recruitment in the times of machine learning. *Management Systems in Production Engineering*, 27(2), 105-109.

Rigotti, D., & Pegoretti, A. (2024). Recycling of LDPE-PVC blends from cable waste: Mechanical characterization and performance optimization. *Results in Materials*, 23, Article 100608.

Roblek, V., Dimovski, V., Mesko, M., & Peterlin, J. (2022). Evolution of organisational agility: A bibliometric study. *Kybernetes*, 51(13), 119-137.

Roumbanis, L. (2017). Academic judgments under uncertainty: A study of collective anchoring effects in Swedish Research Council panel groups. *Social Studies of Science*, 47(1), 95-116.

Saxena, M., Bagga, T., & Gupta, S. (2021). HR during COVID-19 era: Study on recent HR transformations through technological tools and trends. In *Proceedings of the 11th International Conference on Cloud Computing, Data Science & Engineering (Confluence)* (pp. 110–113). Institute of Electrical and Electronics Engineers.

Solanki, M., & Baroda, S. (2024). Three decades of research in the perceived organizational performance: A bibliometric analysis. *Global Knowledge, Memory and Communication*, 23(3), 1-18.

Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and a path forward. *California Management Review*, 61(4), 15-42.

Thanka, M. R., Edwin, E. B., Ebenezer, V., Sagayam, K. M., Reddy, B. J., Günerhan, H., & Emadifar, H. (2023). A hybrid approach for melanoma classification using ensemble machine learning techniques with deep transfer learning. *Computer Methods and Programs in Biomedicine Update*, 3, 1-9, Article 100103.

Tusquellas, N., Palau, R., & Santiago, R. (2024). Analysis of the potential of artificial intelligence for professional development and talent management: A systematic literature review. *International Journal of Information Management Data Insights*, 4(2), 1-9, Article 100288.

Vedapradha, R., Hariharan, R., Praveenraj, D. D. W., Sudha, E., & Ashok, J. (2023). Talent acquisition-Artificial intelligence to manage recruitment. *E3S Web of Conferences, 376*, Article 05001. EDP Sciences.

Veloutsou, C., & Liao, J. (2023). Mapping brand community research from 2001 to 2021: Assessing the field's stage of development and a research agenda. *Psychology & Marketing*, 40(3), 431-454.

Viedma-Del-Jesus, M. I., Perakakis, P., Muñoz, M. Á., López-Herrera, A. G., & Vila, J. (2011). Sketching the first 45 years of the journal *Psychophysiology* (1964-2008): A co-word-based analysis. *Psychophysiology*, 48(8), 1029-1036.

Vishwanath, B., & Vaddepalli, S. (2023). The future of work: Implications of artificial intelligence on HR practices. *Tuijin Jishu/Journal of Propulsion Technology*, 44(3), 1711-1724.

Vitak, J., & Zimmer, M. (2023). Surveillance and the future of work: Exploring employees' attitudes toward monitoring in a post-COVID workplace. *Journal of Computer-Mediated Communication*, 28(4), Article zmad007.

Volchek, K. (2024). Review of the book *AI: Unexplainable, unpredictable, uncontrollable*, by R. V. Yampolskiy (2024). *Robonomics: The Journal of the Automated Economy*, 5, 64.

Wang, X., Haque, M. J., Li, W., Butt, A. H., Ahmad, H., & Shaikh, H. A. (2021). AI-enabled E-recruitment services make job searching, application submission, and employee selection more interactive. *Information Resources Management Journal (IRMJ)*, 34(4), 48-68.

Zafar, A. (2024). Balancing the scale: Navigating ethical and practical challenges of artificial intelligence (AI) integration in legal practices. *Discover Artificial Intelligence*, 4(1), 27.

Zakaria, R., Ahmi, A., Ahmad, A. H., & Othman, Z. (2021). Worldwide melatonin research: A bibliometric analysis of the published literature between 2015 and 2019. *Chronobiology International*, 38(1), 27-37.

Zhu, J., & Liu, W. (2020). A tale of two databases: The use of Web of Science and Scopus in academic papers. *Scientometrics*, 123(1), 321-335.