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A REVIEW ON ARTIFICIAL INTELLIGENCE IN TALENT MANAGEMENT FOR EMPLOYABILITY

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ABSTRACT
Artificial intelligence (AI) have rapidly evolved from abstract concepts into pivotal tools across various industries, transforming business operations and reshaping employability. In the context of job markets, AI and ML are no longer confined to improving efficiency; they also play a critical role in enhancing employability by addressing the changing demands of the modern workforce. This paper explores the publications in AI and its impact on talent management and employability. Overall, 116 papers have been analysed. This paper has investigated the relationship between AI and Talent management (TM) from a perspective of employability using bibliometric analysis. Additionally, the challenges and opportunities brought by these technologies are discussed. The paper also identifies important clusters of keywords for future researchers on this theme.

Introduction
Technological advancements in the 21st century have catalyzed the transformation of industries, including education, healthcare, and commerce. Artificial Intelligence (AI) has revolutionzed the business world and has a profound impact on Human Resource (HR) processes like talent management and talent development (Perifanis & Kitsios, 2023). The AI has garnered attention due to their ability to analyze vast amounts of data, make predictions, and optimize decision-making processes. When applied to employability, AI and ML enable both employees and employers to make informed decisions, ensuring a more efficient and data-driven approach to hiring and job seeking. The HR management uses concept of talent. Talent management plays a significant role in identifying, training and developing employees within an organization (Berger & Berger, 2010) and providing learning and development to develop the acquired talent (Garavan et al., 2024). The professional development is also a part of talent management which aims at encouraging individual growth (Collin et al., 2012) and developing formalised training programs developing the existing talent (Nixon & Helms, 2002). The advent of big data and AI led applications adds precision to the forecasting and hiring processes. AI tools and automation is used widely in short listing of resumes which has led to effective talent acquisition by creating a good match between job requirements and applicant's skill sets(Tariq, M. U. 2024; Tusquellas, N., et al. 2024; Manoharan, G.et al 2024). One of the significant contributions of AI and ML is in the optimization of job matching, ensuring the right candidate is matched to the right job. ML models can analyze extensive data sets, including skills, job histories, industry trends, and employer needs, to suggest roles that fit a candidate's profile. This reduces mismatches and increases job satisfaction and retention rates.The automation of HR systems and processes has added flexibility and agility to the organizational structures. The data driven functions provides real time data and enables a faster decision making process (Manoharan, G.et al 2024).

AI in Talent Acquisition
AI and associated technologies like deep learning and machine learning allows machines to learn from data and improve their performance over time without explicit programming. It involves algorithms that can identify patterns and make predictions. AI, in a broader sense, refers to machines simulating human intelligence processes, such as problem-solving, learning, and decision-making. Both technologies are utilized in various aspects of employment, from

identifying relevant skills for candidates to automating repetitive recruitment tasks.For instance, machine learning models can predict the success of a candidate in a particular role by analyzing their historical job performance, educational background, and soft skills. LinkedIn, for example, uses AI to suggest jobs to users based on their profiles, helping employers find candidates whose skills align with job openings. AI-based chatbots are also increasingly used in the initial stages of hiring, automating the screening process by conducting preliminary interviews and answering candidate queries. By automating repetitive tasks, such as resume screening, companies can significantly reduce time-to-hire, improve the quality of hires, and reduce bias in the selection process. This application of AI in hiring improves employability for job seekers by offering tailored opportunities that align with their skills and aspirations.

Skill Development and Personalized Learning

Professional development is a necessity as it enables a worker enhance the workers' knowledge and skills and experience at the workplace. Thus they become professionally successful and valued (Keep & Storey, 2014). As the nature of work changes with rapid technological advances, so do the skills required by employers. Employees must continuously adapt to new demands, and this is where AI and ML can play a crucial role. Through personalized learning platforms powered by machine learning, individuals can identify skill gaps and pursue targeted learning paths. The AI has altered the learning ecosystems in a big way as it make learning more engaging and multi dimensional (Lytovchenko et al., 2022; Rožman, Oreški & Tominc, 2022).The processes to analyze the skill gaps and creating a learning path for employees to support their professional growth is quite distinctive as compared to traditional execution patterns. A good learning and development system also results in talent attraction and high rate of talent retention (Vnoučková, 2013). Moreover, AI can assist individuals in plotting their career pathways by analyzing data on successful career trajectories. For example, IBM's Watson Career Coach uses AI to provide personalized career guidance to employees, helping them explore new career opportunities or make informed decisions about skill development. These AI-driven platforms can analyze an employee's current role, performance, and interests, offering recommendations for career advancement. For employers, AI ensures the efficient allocation of human resources by predicting the future demand for specific roles and skills, allowing them to plan ahead and invest in upskilling their employees.

Online education platforms like Coursera, Udemy, and LinkedIn Learning leverage AI to provide customized course recommendations based on a user's career trajectory and skillset. These platforms analyze user behavior, assess performance, and suggest the most relevant learning materials to enhance employability. Machine learning algorithms can also predict industry trends, guiding users on which skills will be in high demand in the future. Incorporating AI into education systems also benefits educational institutions by allowing them to develop curricula that are responsive to current industry needs, thereby enhancing graduates' employability.

Deep Reinforcement Learning (DLR) is AI algorithm which act as a Multi State-Actor to suggest best alignment between the jobs and candiadtes's skill sets(Boudi et al., 2023). In Kruskal algorithm the psychological test are are used to identify skill sets of candidates along with a provision of forecasting the future needs (Kaushik et al., 2023). The recruitment process use Machine Learning (ML) models to recruit analyze the exsisting skills sets of candidate along with training and development needs (Ammer et al., 2023). The mathematical programming employed to decide acceptance and rejection of an applicant reduces the chances of human errors (França et al., 2023). Usage of BP neural network to power a personnel competency model analyzes the employees' performance and their potential for development in the organization ladder (Zhang & Yuan, 2022). The natural language processing and classification analysis alogrithims play role in

increasing productivity. They predict skill sets and suggest new skilss and propose job profile changes accordingly (Yadav et al., 2023).

Methodology

A survey of 116 research paper was done from year 2016 to 2024. A bibliometric analysis of papers was done. The bibliometric method is a process which gives us a brief review on the way a particular research theme has developed over a period of years in terms of authors, journals, publishers, countries, disciplines, universities, references and citation counts. The database was fro Scopus database by different permutations and combinations of keywords used to search papers (i.e "Talent Management" and "Artificial Intelligence"). A total of 116 papers were left for analysis.

Results and Discussions

The publications under this research theme started in the year 2016 with 1 paper(Fig. 4). The steady growth in this area was seen in year 2019 (7 papers), 2020 (8 papers), 2021 (13 papers), 2022 (10 papers), 2023(29papers) and 2024(47 papers) is mentioned in Table 1. The majority of the papers published in this area (Table 1) in Business, Management and Accounting(54), Computer Science(43), Engineering(37), Economics Econometrics and finance(24), SCocial Sciences(23), Decision Sciences(19), Emergy(15), Psychology(13), and Arts and Humanities(9). The types of papers available in SCOPUS for the access. This indicates that maximum belongs to 102 peer reviewed journals and 14 conference papers. Lectures notes in network and systems had 6 papers, followed by Aip conference proceedings 3, Analysis and Metaphysics 3, E3s Web of Conferences 2 and ACM conference 1. The documents published by the country of territory shows in Indis(36), US(19), Russian Fed(7), Austraila(6), China(6), Indonesia(5), Malaysia(5)., and Saudi Arbia(5). The type of documents published as Article(49), Conefernce Paper(37), Book Chapter(24), Book(2), and Review (2).

Keywords of counpling analysis is shown in figure .
The citations are must to understand the impact of published papers adn articles. The records of SCOPUS says that 56 documents out of 116 have got 766 citations. The average citation per item is 7.34. The h-index of 15.

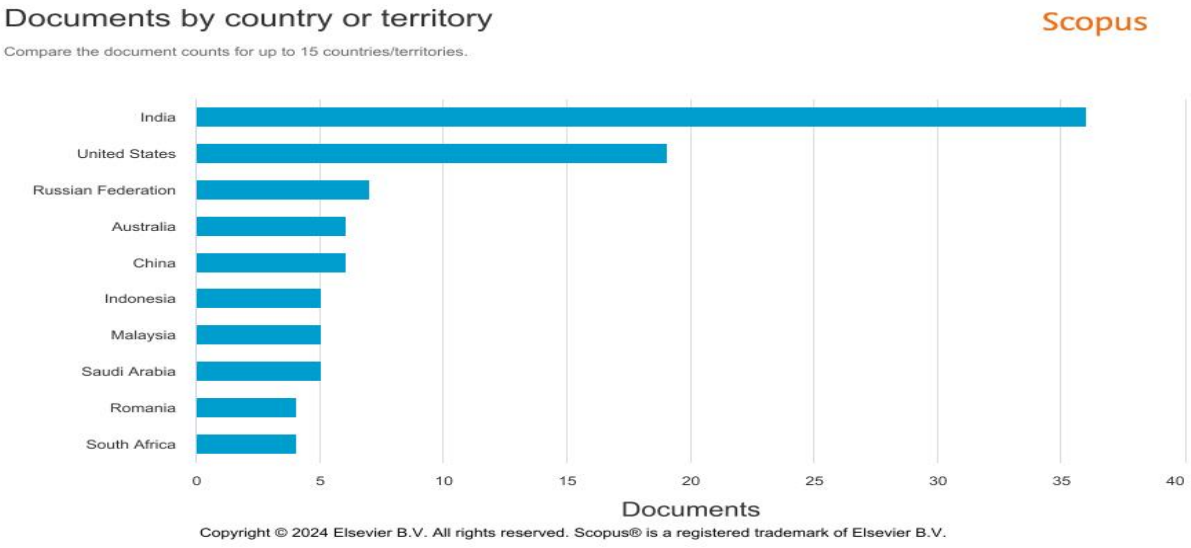

Figure 1 Documents by Country from SCOPUS

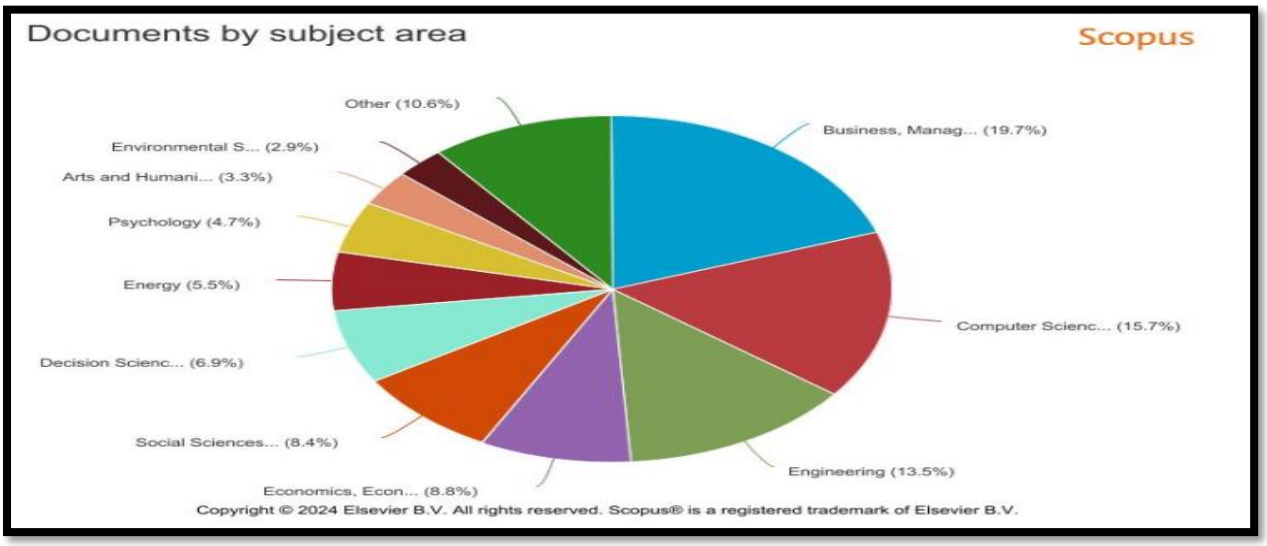

Figure 2 Publications in Subject Area from SCOPUS

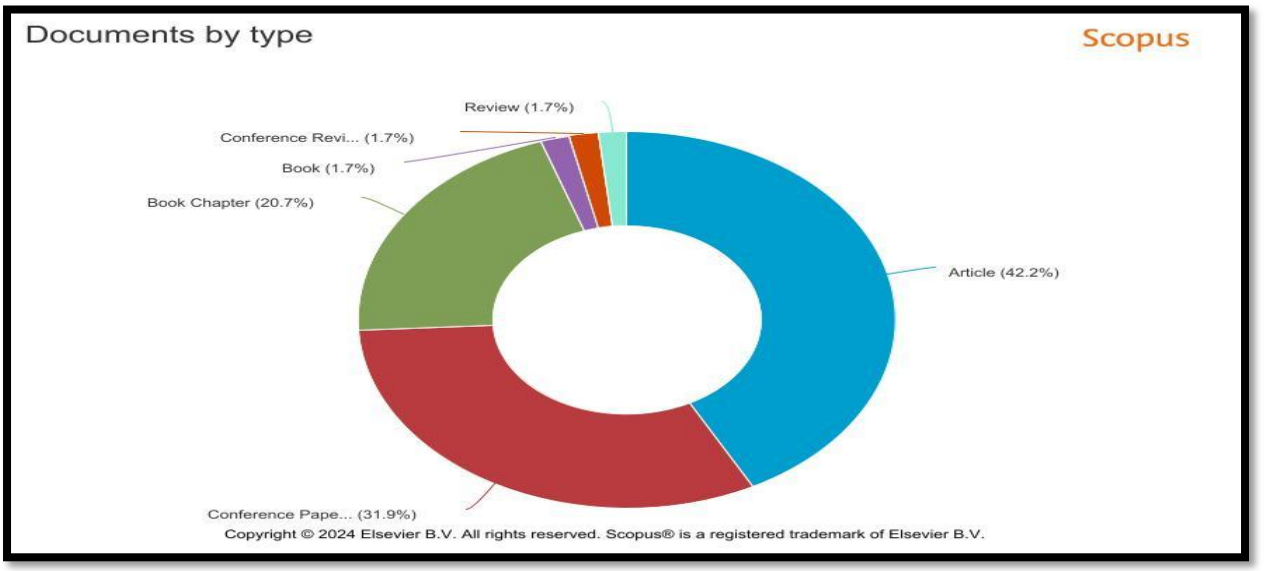

Figure 3 Types of publications from SCOPUS

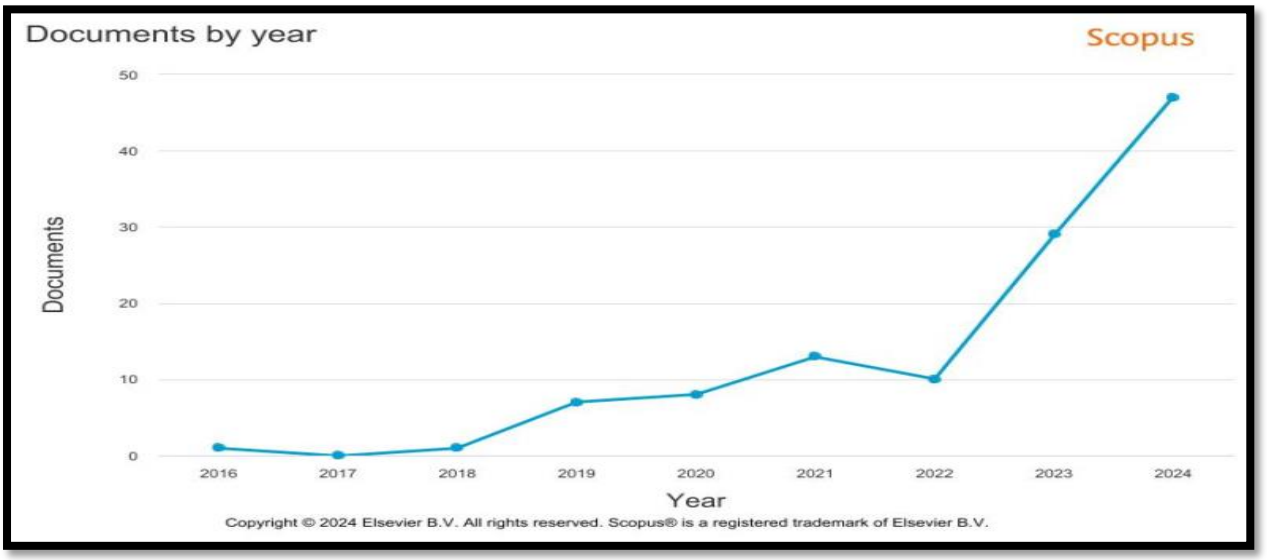

Figure 4 Publications 2016-2014 from SCOPUS

Year	Documents
2024	47
2023	29
2022	10
2021	13
2020	8
2019	7
2018	1
2017	0
2016	1

Table 1 Documents Published summary

Cluster 1	Cluster 2	Cluster 3
15 Items	12 Items	9 Items
Business	Algorithm	Automation
Company	Article	Effectiveness
Effect	Author	Future
Chapter	Context	HRM
Field	Design	Human Resource Management
Human Resource	Framework	Integration
Importance	Literature	Recruitment
Industry	Model	Talent Acquisition
Machine Learning	Organization	Training
Performance	Originality	
Person	Paper	
System	Skill	
Time		
Way		
Workplace		

Table2 Identifying Clusters

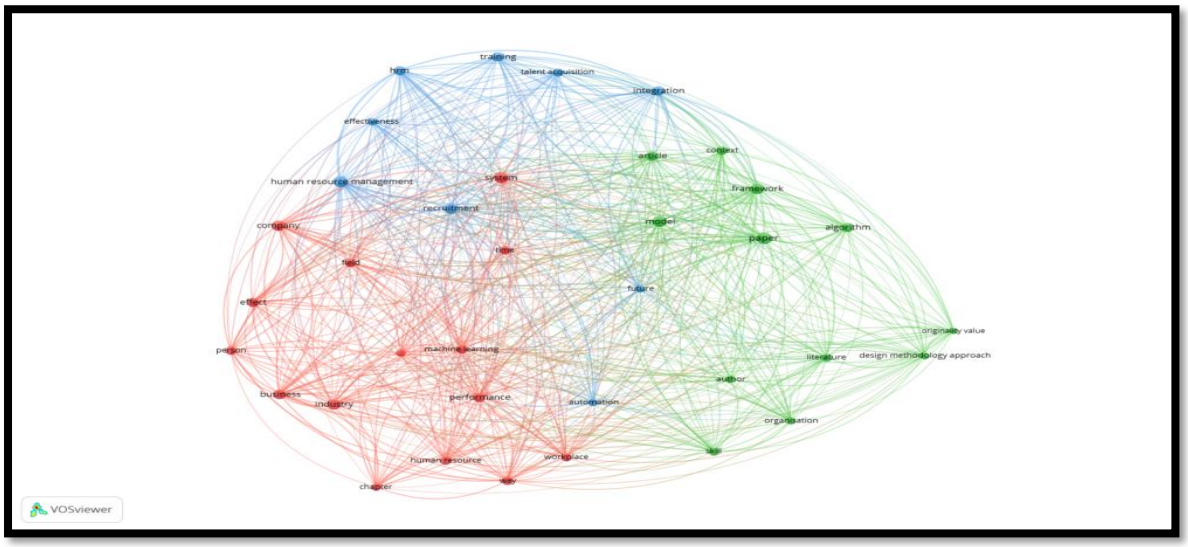

Figure 5 Identifying Clusters using Vosviewer

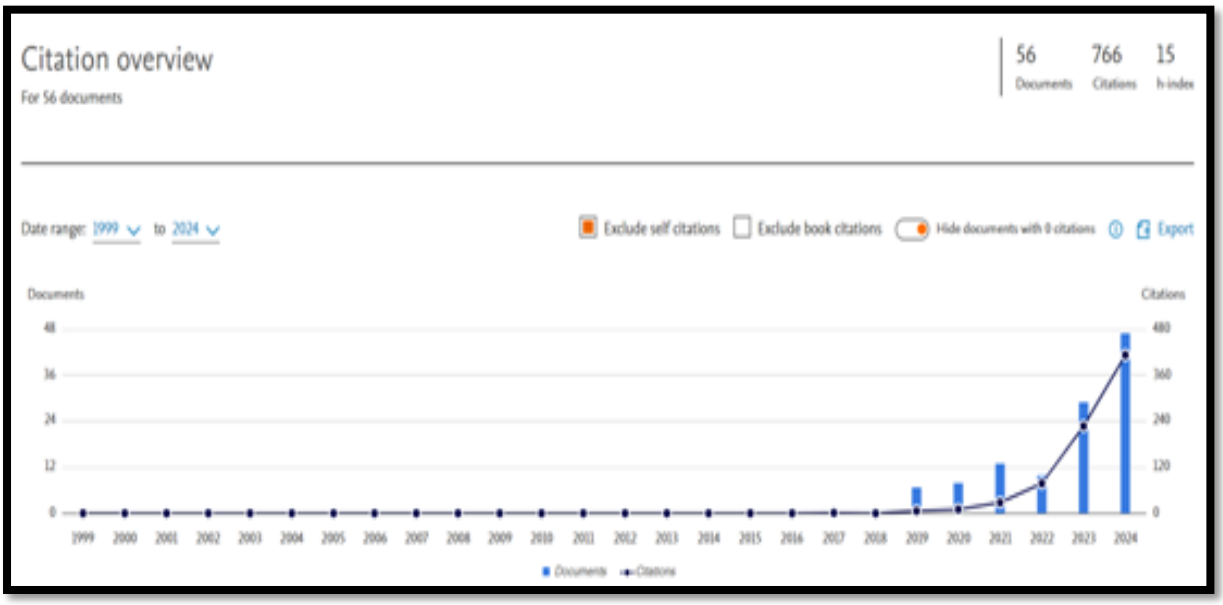

Figure 6 Citation Overview from SCOPUS

Challenges of AI and ML in Employability

While AI and ML offer numerous advantages in employability, several challenges must be addressed. One key issue is the potential for bias in algorithms. Although AI is often touted as a solution to human bias, it can inadvertently perpetuate biases if trained on biased data. For example, if an AI model is trained on data from historically male-dominated industries, it might favor male candidates over female ones.Another challenge is the digital divide. As AI and ML technologies become integral to employability, individuals without access to these technologies may find themselves disadvantaged. This can exacerbate inequalities in the job market, especially for individuals in developing regions or those lacking the resources to upskill.Moreover, the rise of AI and ML in the job market has led to concerns about job displacement. While these technologies create new roles, they also render some jobs obsolete, particularly those involving routine, manual tasks. The challenge for society is to manage this transition, ensuring that workers are reskilled and provided with opportunities in emerging sectors.

Future Trends and Opportunities

The future of AI in employability is promising through talent management. As AI technology advances, it will increasingly focus on improving soft skills, emotional intelligence, and creativity in candidates, areas where human capabilities excel. Predictive talent analytics will also become more sophisticated, enabling employers to anticipate workforce needs with even greater precision. Furthermore, AI-driven mentorship programs could revolutionize how employees receive feedback and guidance throughout their careers. Instead of traditional annual reviews, AI systems could provide real-time feedback based on performance metrics, helping employees improve continuously. AI and ML will also likely become central to corporate learning and development programs, enabling personalized, on-demand learning tailored to an individual's career goals and the company’s strategic objectives.

Conclusion

AI and ML are transforming employability by streamlining recruitment, improving skill development, and optimizing job matching. However, these technologies also pose challenges, including potential bias and job displacement. To fully harness the benefits of AI in employability, organizations and policymakers must address these challenges while promoting equitable access

to AI-driven tools and learning platforms. As AI continues to evolve, its potential to shape the future of work and employability will only grow, making it an indispensable asset in modern workforce management.

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