North American Journal of Engineering and Research

Est. 2020

The Future of Recruitment: Analyzing the Impact of Artificial Intelligence on Evolving Hiring Processes and Strategies

Shweta Pandey
Email: shweta1780@gmail.com

Abstract

The recruitment process poses significant challenges for many organizations, often proving to be both costly and time-consuming. The task of identifying and selecting the most suitable candidates is frequently hindered by subjective decision-making and inefficiencies, which can lead to suboptimal hiring outcomes. To mitigate these issues, businesses have increasingly turned to technology, incorporating internet-based platforms and specialized software to streamline application submissions and candidate evaluations. However, despite these technological interventions, coordinating the entire recruitment process remains labor-intensive, requiring considerable time and financial resources. In response to these persistent challenges, there has been a growing adoption of Artificial Intelligence (AI) in recruitment processes on a global scale. AI's integration into recruitment has demonstrated potential in reducing costs, minimizing decision-making errors, and significantly improving efficiency by saving time. This paper examines the transformative impact of AI on recruitment within the broader context of Human Resource Management (HRM). It explores the specific stages of the traditional recruitment process where AI can be effectively implemented to enhance overall efficiency and effectiveness. Additionally, this paper considers the broader implications of AI integration in recruitment, including its potential to redefine traditional HRM practices.

Keywords: Artificial Integration (AI), Recruitment Process, Technological Advancements, Human Resource Management (HRM).

Introduction

In the contemporary globalized landscape, traditional business practices are increasingly being challenged. Organizations are no longer competing solely with local firms; the rise of new technologies has compressed geographical boundaries, forcing companies to contend on a global stage [1]. In this context, staying competitive necessitates the adoption and integration of these technological advancements. Human Resource Management (HRM), a multifaceted discipline encompassing training, recruitment, employee relations, and organizational development, plays a crucial role in this regard [2]. Employees serve as reservoirs of knowledge and expertise—resources that every organization must effectively acquire and retain to maintain a competitive edge. As such, the recruitment process, which facilitates the acquisition of these valuable human resources, is fundamental to organizational success [3].

Traditionally, recruitment has been a time-consuming process, often burdened by extensive paperwork and lengthy procedures. However, the

advent of online recruitment platforms has already begun to streamline and expedite these processes [4]. In recent years, research has increasingly focused on the intersection of HRM and technology, exploring how technological innovations can optimize and enhance the recruitment process [5]. A significant trend in this area is the growing automation of recruitment tasks, driven by technological advancements, which has gradually diminished the human element in recruitment [6]. For instance, Baxter [7] predicts that trends such as predictive analytics will reduce the guesswork inherent in recruitment, and he highlights Artificial Intelligence (AI) as a tool that will play a significant role in candidate interviews.

This paper aims to delve into one of the most recent technological advancements in recruitment: Artificial Intelligence (AI). The application of AI in HRM, particularly in recruitment, emerged as a notable trend in 2018, signaling what could be described as the "new age of HR." AI is revolutionizing the recruitment industry by automating routine tasks traditionally handled by human recruiters [8].

AI, as a field, is broad and multidisciplinary, intersecting with domains such as computing, linguistics, and philosophy, among others [9]. AI can manifest in various forms, including robots, bots, or software [9]. The concept of AI, a relatively novel area within engineering and science, has been the subject of study since the Second World War, with the term "Artificial Intelligence" being coined in 1956 [10]. Salin and Winston [11] define AI as a collection of techniques that enable computers to perform tasks that would typically require human reasoning and intelligence. Nilsson [12] expands on this by suggesting that machines should be capable of performing most tasks that demand human intelligence, a concept he refers to as "human-level AI." However, this study will concentrate on the integration of AI into software applications employed by companies during recruitment, rather than on AI as physical robots.

Challenges and Inefficiencies in Traditional Recruitment Processes

Recruitment, as a multifaceted psychosocial process, is fundamentally aimed at engaging potential candidates who meet specified qualifications within a constrained time frame, with the goal of identifying the most suitable individuals for organizational roles [13]. The literature offers varied conceptualizations of the recruitment process; however, a consensus exists around certain core stages, notably the development of job descriptions, candidate sourcing, preliminary screening, interview procedures, candidate engagement strategies, and final selection [14].

In practice, recruiters typically dedicate approximately eight to nine hours to scrutinizing one hundred résumés for a particular vacancy, with the majority—nearly eighty percent—being dismissed during this initial phase [15]. Furthermore, it has become increasingly common for recruiters to manually evaluate a candidate's digital footprint, including their social media activity, as a supplementary tool to infer personality traits and potential fit within the organization's culture [16]. The labor-intensive nature of these screening activities, however, does not always correlate with recruitment success, often resulting in suboptimal outcomes [17]. Traditional recruitment models, which require significant time and resource investments, are now viewed as inefficient in many instances, particularly as they do not consistently yield high-quality hires [18].

In his analysis of recruitment practices, Edwards [19] posits that organizations prioritize internal hiring mechanisms as their preferred approach to filling vacancies. This is followed by recruitment through employee referrals, with external recruitment being considered only as a tertiary option. According to Edwards, the reliance on online applications is generally a last resort, activated when other channels fail to produce viable candidates, largely due to the cost and time intensiveness associated with extensive external hiring processes.

Foundations and Advances in Artificial Intelligence

As Shapiro [20] defines it, Artificial Intelligence (AI) is a multidisciplinary domain within computer science and engineering, aimed at comprehending and replicating behaviors typically associated with human intelligence. AI endeavors to create systems that demonstrate cognitive functions akin to those of humans. The field has seen remarkable growth, emerging as a dominant technology, gaining increased attention and development annually.

AI technologies, particularly software systems, are highly adaptable, capable of automating routine tasks that require minimal creativity. This automation is largely powered by algorithms, which are structured methods designed to solve complex problems or achieve specific outcomes [21]. These algorithms, combined with machine learning, facilitate the rapid processing of vast data sets, enabling systems to identify patterns, optimize processes, and make predictive analyses.

Through advanced data processing techniques, AI systems have achieved the ability to understand speech, analyze emotional states, interpret personality traits, and even assess truthfulness. By leveraging pattern-matching technologies, AI is capable of learning, predicting potential outcomes, and making decisions based on a variety of criteria [18]. Although machine learning models still fall short of human cognitive capabilities, they have advanced significantly in performing fundamental cognitive functions such as learning, decision-making, and reasoning [22].

The Rationale for Integrating Artificial Intelligence in Recruitment

The proliferation of Artificial Intelligence (AI) across global industries has heralded significant opportunities to revolutionize various facets of labor sectors, with Human Resources (HR) and, more specifically, recruitment being particularly impacted [23,24]. The imperative to integrate AI into HR functions is driven by a confluence of factors aimed at addressing inherent inefficiencies and biases in traditional recruitment processes. These biases, often manifesting as human error, can undermine decision-making integrity and expose organizations to the risk of discriminatory practices [21]. Furthermore, AI introduces the promise of enhancing efficiency by automating repetitive tasks, thereby reducing both the temporal and financial expenditures associated with recruitment activities.

AI's utility in recruitment is underscored by its foundational role in predictive analytics. Recruitment, at its core, represents a predictive challenge, wherein the objective is to ascertain which candidates possess the potential to perform effectively in designated roles [25]. The deployment of AI-driven algorithms in this context not only seeks to optimize the precision of hiring decisions but also endeavors to minimize the subjective biases that traditionally accompany human judgment. Consequently, the integration of AI in recruitment processes is poised to advance organizational efficacy, foster equitable hiring practices, and streamline operational workflows.

Advantages of Artificial Intelligence in Recruitment

Optimizing Hiring Efficacy through Algorithmic Segmentation:

In the recruitment domain, selecting the most suitable candidates from a large pool of applicants is a critical task for HR professionals. Artificial Intelligence (AI) facilitates this process by segmenting it into multiple automated stages. This methodological approach allows recruiters to aggregate and analyze extensive data on each candidate, thus enabling more effective evaluations. Numerous AI-driven solutions are available that employ sophisticated algorithms to assess candidates' skills and experiences with greater precision [26].

Leveraging Advanced Analytics for Strategic Candidate Placement: AI empowers HR managers to make informed decisions by aligning candidates' skills with appropriate positions within

the organization. This advanced analytical approach not only enhances business productivity but also encourages candidates to further develop their competencies. Moreover, AI systems exhibit a higher degree of accuracy in candidate selection compared to traditional human recruiters [26].

Enhancing Temporal Efficiency and Resource Allocation via Automated Evaluation: Time is a critical resource in any organization, and the recruitment sector is no exception. AI offers numerous solutions for swiftly evaluating candidates' abilities. AI-based software can process large volumes of data within seconds, delivering clear and actionable insights for decision-makers. This efficiency not only conserves time but also reduces associated costs and resource expenditures [26].

Reducing Bias through Data-Driven, Objective Decision-Making Processes:

Human involvement in recruitment processes inherently carries the risk of unconscious or conscious bias. AI solutions can significantly reduce this bias, allowing for more objective hiring decisions. By relying on data and resumes, AI ensures that selections are based on candidates' true potential and qualifications, thus promoting fairness and minimizing discriminatory practices [26].

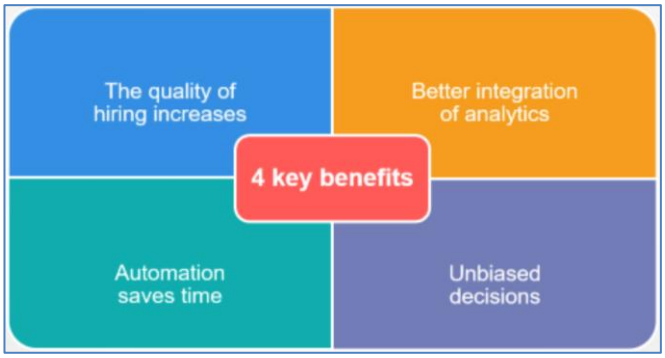

Fig 1: 4 key benefits of using AI in Recruiting [26]

The Evolution of Recruitment Processes Through Artificial Intelligence: From Ad Placement to Decision-Making

Optimizing Recruitment Ad Placement through Algorithmic Precision:

The complexities involved in optimizing job advertisement placements—including determining visibility, timing, and content modifications—often overwhelm human recruiters, leading to inefficiencies and errors [23]. AI can streamline this process by rapidly analyzing candidate data and optimizing ad placements with high precision. By leveraging historical online activity, AI systems can enhance targeting, ensuring that job ads reach the most relevant candidates at optimal times [27]. For example, technologies like 'Textio' assess the effectiveness of ad content in terms of response rates and gender appeal, though these methods may raise privacy concerns, necessitating adherence to data protection regulations [23].

Enhancing Applicant Screening and Sourcing through Advanced AI Analytics:

AI excels in screening and sourcing by automating the assessment of incoming applications. Unlike traditional methods that rely heavily on keyword matching, AI systems can evaluate candidates' qualifications through comprehensive data analysis, offering a more nuanced view of their skills and experience [27]. Tools like Mya, an AI-powered chatbot, conduct initial screenings and streamline the recruitment process by efficiently sorting candidates and reducing manual workload [23]. While AI introduces objectivity and reduces biases linked to human emotions and prejudices, it is important to recognize that human intuition remains valuable for nuanced decision-making [28].

Transforming Candidate Engagement through Programmatic and Automated Communication:

AI not only benefits recruiters but also enhances the job-seeking experience. Programmatic technology improves job visibility and candidate discovery, while automated communication tools keep candidates engaged throughout the application process [23]. AI-driven chatbots, available 24/7, provide candidates with timely responses and personalized interactions, addressing queries about

the application process and maintaining engagement [18]. Additionally, AI tools help address the common issue of "black hole" feedback by managing communication and providing personalized updates to candidates, thereby improving their overall experience [27].

Leveraging AI for Objective Interviewing and Data-Driven Decision Making: In the final stages of recruitment, AI can facilitate automated video interviews, assessing candidates' responses and non-verbal cues to compare them with high-performing employees [23]. Research suggests that AI can enhance decision-making efficiency, particularly in low-skilled positions [30]. However, for mid- and high-skilled roles, human oversight remains crucial, with AI serving as a supportive tool rather than a replacement [33]. AI's lack of emotional influence can mitigate biases and improve the consistency of assessments, though human input is essential for final decisions [22]

The Future Trajectory of Recruitment in the Age of Artificial Intelligence

In the contemporary landscape, the ascendance of Artificial Intelligence (AI) has ignited a robust debate regarding its implications for the recruitment sector. The trepidation surrounding AI's potential to overshadow traditional recruitment roles is met with a juxtaposed optimism about its capabilities. While some practitioners' express reservations about AI's efficacy in replicating the nuanced facets of their work, others voice concerns over the displacement of human jobs. Despite AI's escalating integration into workplace processes, there remains an ongoing discourse about its capacity to disrupt existing employment paradigms within recruitment.

It is well-documented that machines are proficient in executing repetitive and mundane tasks; thus, the encroachment of AI into recruitment processes is anticipated to augment the value of human labor. Presently, although automation may curtail employment opportunities within certain facets of recruitment, the necessity for human intervention remains pronounced in the final stages of the recruitment continuum, including interviewing and selection [23]. AI's role in enhancing decision-making during these stages is contingent upon human oversight, as AI alone cannot guarantee superior outcomes [23]. Nevertheless, the advent of technology has undeniably reduced human effort, minimized errors, and mitigated procedural burdens [18].

Looking forward, the automation of job advertisements, candidate screening, scheduling, and interview management is poised to become increasingly prevalent. If adopted with due consideration, AI has the potential to substantially benefit HR professionals by facilitating a shift towards strategic and creative endeavors, such as problem-solving, relationship cultivation, and the application of emotional intelligence. Ahmed [18] envisions a future centered on optimizing employee experience and tailoring engagement strategies to individual needs. By alleviating the administrative load, AI can enable recruiters to focus on more strategic and impactful projects [28].

Furthermore, AI is expected to refine job matching processes, enhancing candidates' ability to apply for roles that align with their preferences. The transformative potential of AI in automating recruitment processes necessitates careful consideration of candidates' interactions with these technologies. The consensus among professionals is that AI's integration is pivotal to advancing and refining the recruitment experience, underscoring the need for a nuanced approach to its implementation.

Conclusion

The integration of Artificial Intelligence (AI) into recruitment processes represents a profound shift in Human Resource Management (HRM), addressing long-standing inefficiencies and biases while offering significant enhancements in efficiency and accuracy. As organizations increasingly adopt AI technologies, they are poised to transform the traditional recruitment landscape, making the process more data-driven and objective. This transformation promises to streamline various stages of recruitment, from job advertisement and

candidate screening to final decision-making and candidate engagement. However, while AI offers substantial benefits, it also raises important considerations regarding the balance between technological automation and human oversight.

Key findings from this study highlight the following:

- **Enhanced Efficiency and Accuracy**: AI has demonstrated its ability to significantly improve the efficiency of recruitment processes by automating repetitive tasks and providing precise data analysis. This not only reduces the time and cost associated with hiring but also enhances the accuracy of candidate evaluations and selection [26].
- **Reduction of Bias and Subjectivity**: By minimizing human biases, AI facilitates more objective decision-making in recruitment. This shift towards data-driven assessments helps promote fairness and equity in hiring practices, potentially reducing instances of discrimination and improving overall recruitment outcomes [26].
- **Strategic Reorientation for HR Professionals**: As AI assumes more administrative and routine tasks, HR professionals are increasingly able to focus on strategic activities such as relationship building, creative problem-solving, and employee engagement. This shift aligns with a broader trend towards enhancing the employee experience and optimizing HR practices [28].
- **Ongoing Need for Human Oversight**: Despite the advancements brought by AI, human intervention remains crucial, particularly in the final stages of the recruitment process. The nuanced judgment and emotional intelligence of human recruiters continue to play a vital role in ensuring that final hiring decisions are well-informed and contextually appropriate [23].

In conclusion, the application of AI in recruitment offers a promising avenue for advancing HRM practices, driving efficiency, and fostering more objective hiring processes. As organizations navigate the evolving landscape of recruitment technology, they must strike a careful balance between leveraging AI's capabilities and maintaining essential human oversight. By doing so, they can fully realize the benefits of AI while preserving the critical human elements that contribute to successful recruitment and organizational success.

References

[1] "The economic benefits of globalization for business and consumers," book, 2019. [Online]. Available: https://ecipe.org/wp-content/uploads/2018/01/Globalization-paper-final.pdf

[2] T. D. Wall and S. J. Wood, "The romance of human resource management and business performance, and the case for big science," Human Relations, vol. 58, no. 4, pp. 429–462, Apr. 2005, doi: 10.1177/0018726705055032.

[3] J. De Kok and L. M. Uhlaner, "Organization Context and Human Resource Management in Small Firm," Small Business Economics, vol. 17, no. 4, pp. 273–291, Jan. 2001, doi: 10.1023/a:1012238224409.

[4] D. O'Donovan, "HRM in the Organization: An Overview," in Management and industrial engineering, 2019, pp. 75–110. doi: 10.1007/978-3-030-13229-3_4.

[5] E. Galanaki, A. Lazazzara, and E. Parry, "A Cross-National Analysis of E-HRM Configurations: Integrating the information technology and HRM perspectives," in Lecture notes in information systems and organisation, 2018, pp. 261–276. doi: 10.1007/978-3-319-90500-6_20.

[6] T. Bondarouk and C. Brewster, "Conceptualising the future of HRM and technology research," The International Journal of Human Resource Management, vol. 27, no. 21, pp. 2652–2671, Sep. 2016, doi: 10.1080/09585192.2016.1232296.

[7] Baxter, M. (2018). Business Analytics Intelligence. Information-age.

www.information-age.com/business-analytics-intelligence-123477004/
[8] A. K. Upadhyay and K. Khandelwal, "Applying artificial intelligence: implications for recruitment," Strategic HR Review, vol. 17, no. 5, pp. 255–258, Oct. 2018, doi: 10.1108/shr-07-2018-0051.
[9] G. Tecuci, "Artificial intelligence," Wiley Interdisciplinary Reviews Computational Statistics, vol. 4, no. 2, pp. 168–180, Dec. 2011, doi: 10.1002/wics.200.
[10] Russell, S. J. 1., Norvig, P., & Davis, E. (2010). Artificial intelligence: a modern approach. 3rd ed. Upper Saddle River, NJ, Prentice Hall.
[11] Machine learning and artificial intelligence. 1992. [Online]. Available: https://d1wqtxts1xzle7.cloudfront.net/100484208/ac00025a74220230331-1-15cgk9-libre.pdf?1680253887=&response-content-disposition=inline%3B+filename%3DMachine_Learning_and_Artificial_Intellig.pdf&Expires=1725495992&Signature=ZVRmKLCfbIt9CIhJXvH9WOy1qHiM41yHUlVBBRKPlPI8VXWyhcj3GW-cQHTELDtOi0vgEA1dvKUIc54wfW9wJhRFAsJcx1IWgp-9iJHcXCoLG5eWMGYK4nD~LLuJkh1Ywb-i7L2SQU7IBD8sXAaFr6sr5x~dJI4iQ-OVCVO-WTW-sK5ciG0XrRniO7JQgECVxy24ALmMKLs0p-a9fITWCYrf-mrl0zr0hWTVjVZR7o488ppa80yqlMPOCWVJOyxPbwYgq9DKufj9chih0XBYcaSXgjQ06bKwkQhoyzY283czCG0ynCUuZiVTx6-Tpq5pHb0dgaGgtKg0Hp19LqPaqw__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA
[12] N. J. Nilsson, "Human-Level artificial intelligence? Be serious!," AI Magazine, vol. 26, no. 4, pp. 68–75, Dec. 2005, doi: 10.1609/aimag.v26i4.1850.
[13] Mondy, R. Wayne, Martocchio, Joseph J.. (2016). Human Resource Management, 14th ed. (14). : Pearson Education Inc.
[14] S. Hekkala, "Integration of Artificial Intelligence into Recruiting Digital Natives in Finland: The Perceptions of 20-23-Year-Old Students," 2019. https://urn.fi/URN:NBN:fi:aalto-201910135668
[15] HR.com Limited, "How artificial intelligence is improving talent acquisition - HR.com," © Copyright HR.COM Limited. https://www.hr.com/en/magazines/all_articles/how-artificial-intelligence-is-improving-talent-%20ac_j0c8jqu4.html
[16] E. Faliagka, M. Rigou, and S. Sirmakessis, "An e-Recruitment system exploiting candidates' social presence," in Lecture notes in computer science, 2015, pp. 153–162. doi: 10.1007/978-3-319-24800-4_13.
[17] S. Dalgleish, "Recruiting quality," Quality, vol. 44, no. 6, p. 14, Jun. 2005.
[18] O. Ahmed, "Artificial intelligence in human resources," IJRAR, Dec. 2018, doi: 10.31221/osf.io/cfwvm.
[19] Edwards DC. People and Technology: a winning recruiting combination. Career Planning Adult Develop. J. 2016;32(3):45–50
[20] S. C. Shapiro, "Knowledge representation," Encyclopedia of Cognitive Science, Jan. 2006, doi: 10.1002/0470018860.s00058.
[21] Chichester, Michael A., Jr., and Jaclyn R. Giffen. "Recruiting in the Robot Age: Examining Potential EEO Implications in Optimizing Recruiting Through the Use of Artificial Intelligence." Michigan Bar Journal, vol. 98, no. 6, June 2019, pp. 34+. Gale Academic OneFile, link.gale.com/apps/doc/A591794691/AONE?u=anon~c3dc2e6f&sid=googleScholar&xid=33137f3c.
[22] "An exploration of how artificial intelligence is impacting recruitment and selection process," eSource, Aug. 26, 2019. https://esource.dbs.ie/handle/10788/3956

[23] Appcast, "The Implications of AI in Talent acquisition | Appcast." https://info.appcast.io/whitepaper/robots-in-recruiting-the-implications-of-ai-on-talent-acquisition-appcast-website
[24] R. Vedapradha, R. Hariharan, and R. Shivakami, "Artificial intelligence: a technological prototype in recruitment," Journal of Service Science and Management, vol. 12, no. 03, pp. 382–390, Jan. 2019, doi: 10.4236/jssm.2019.123026.
[25] N. Nawaz, "Artificial Intelligence interchange human intervention in the recruitment process in Indian Software Industry," International Journal of Advanced Trends in Computer Science and Engineering, pp. 1433–1441, Aug. 2019, doi: 10.30534/ijatcse/2019/62842019.
[26] G. Author, "The role of artificial intelligence (AI) in recruitment," Blog, Sep. 24, 2018. https://www.talentlyft.com/en/blog/article/207/the-role-of-artificial-intelligence-ai-in-recruitment
[27] "Assessing the Fairness of AI Recruitment systems | TU Delft Repository," 2019. https://repository.tudelft.nl/record/uuid:1ce06e89-72a7-47fe-bdbd-93775732a30c
[28] K. Kibben, "Welcome to the Jungle: How artificial intelligence will change the future of recruiting.," RecruitingDaily, May 11, 2016. http://recruitingdaily.com/artificial-intelligence-recruiting-future/
[29] R. Geetha and R. BhanuSree, "Recruitment through Artifical Intelligence: A Conceptual Study," journal-article, Jul. 2018. [Online]. Available: https://iaeme.com/MasterAdmin/Journal_uploads/IJMET/VOLUME_9_ISSUE_7/IJMET_09_07_007.pdf
[30] "The 2019 state of artificial intelligence in talent acquisition: Get ahead of the curve in an area that promises high impact and dramatic growth," HR.com, Jun. 2019. https://www.hr.com/en/resources/free_research_white_papers/hrri---ai-in-talent-%20acquisition-2019-research_jwmzvbl2.html
[31] PwC, R. Charlier, S. Kloppenburg, and Jean-Paul Agon, "Artificial Intelligence in HR: a No-brainer," 2017. [Online]. Available: https://pwc.nl/nl/assets/documents/artificial-intelligence-in-hr-a-no-brainer.pdf
[32] "The impact of artificial intelligence within the recruitment industry: Defining a new way of recruiting." [Online]. Available: https://cfsearch.com/wp-content/uploads/2019/10/James-Wright-The-impact-of-artificial-intelligence-within-the-recruitment-industry-Defining-a-new-way-of-recruiting.pdf
[33] "Productivity and selection of human capital with machine learning," 2016. https://www.hbs.edu/ris/Publication%20Files/PredictiveHiring_4a3d9f9f-62e9-4dad-ac58-e3c3571d3995.pdf