JOURNAL SYNTAX IDEA
p–ISSN: 2723-4339 e-ISSN: 2548-1398
Vol. 6, No. 06, Juni 2024

LITERATURE REVIEW OF DIGITAL RECRUITMENT: HOW EFFECTIVE IS ARTIFICIAL INTELLIGENCE IN SELECTING PEOPLE?

Dahniar Nur Amalina, Siskha Nur Khasanah, Dandy Yuliansyah, Syarifa Hanoum
Institut Teknologi Sepuluh Nopember, Indonesia
Email: dahniar.amalina@gmail.com, siskhanur24@gmail.com, dandyyuliansyah07@gmail.com, syarifa.hanoum@gmail.com

Abstract

The use of artificial intelligence in recruitment can help select candidates according to company standards through a simple, effective, and efficient process. This paper investigates how the AI implementation in the traditional recruitment process transform into the AI-based recruitment and its impact on recruitment processes. We use systematic literature review and content analysis to obtain information regarding research gaps, research limitations, and future research opportunities. We analyze 35 articles collected between 2008 and 2022 showing that AI has several benefits, including increasing the interest of candidates to apply for jobs, increasing efficiency and timeliness, reducing recruitment costs, obtaining the best candidates, and reducing bias in the recruitment process.

Keywords: Artificial Intelligence, Recruitment, Systematic literature review

INTRODUCTION

In a fluctuating environment, organizations are challenged to balance between the uncertainty in different aspects of economic, social and politics and maintaining the company growth (Aula, Hanoum, & Prihananto, 2022). Human resource management (HRM) plays an important role in accelerating company performance (Wedhatama, Hanoum, & Prihananto, 2021)(Rai et al., 2022). A comprehensive study by the Boston Consulting Group has shown that the recruitment function, as a part of HRM, has the most significant impact on companies' revenue growth and profit margins compared to any other function in the field of human resources (HR) management (Black & van Esch, 2020).

Unfortunately, recruiting good talent for companies becomes a problem for HR managers (Albert, 2019). Against the backdrop of the ascending role of human capital, the technological context of how companies recruit people has to change. As the matter of fact, today's leading organizations are fully using social networks, analytics and even cognitive tools to acquire talent in new ways.

Today, companies are at the beginning of what we term Digital Recruiting. At the heart of this transformation is the use of artificial intelligence (AI) in recruiting activities (Alic, 2016). AI is likely to change the role of management and organizational

How to cite:	Dahniar Nur Amalina, Siskha Nur Khasanah, Dandy Yuliansyah, Syarifa Hanoum (2024) Literature Review of Digital Recruitment: How Effective is Artificial Intelligence in Selecting People? *(06) 06,* https://doi.org/10.36418/syntax-idea.v3i6.1227
E-ISSN:	2684-883X
Published by:	Ridwan Institute

practices as an effective human resource management (HRM) tool. The AI adoption of is very useful in recruitment strategies as it has been proven to have drastically reduced the time and cost of performing these functions (Nawaz, 2019).

Advanced HR practices, such as AI, have been investigated to enhance organizational performance (Niehueser & Boak, 2020). Prior researchers, however, have noted a substantial gap between the promise and reality of AI in HRM (Tambe, Cappelli, & Yakubovich, 2019). Moreover,how far the role of AI can help companies in the recruitment process is still a question. Therefore, this paper represents a systematic literature review (SLD), aims to map the role of AI in the recruitment and selection process, as well as its current development.

The remaining article is structured in five sections. Section 2 discuss the trend of AI-related recruitment process. Section 3 describes the research methodology adopted in this study. Section 4 documents results and discussions. Section 5 presents the managerial implication of AI-based recruitment, whilst Section 6 summarises the conclusions, and limitations of the study.

AI has been used and implemented significantly in recruiting professionals in various companies from 2018 and becomes one of the latest trends in the recruitment industry (Upadhyay & Khandelwal, 2018). There has been recent academic interest in how organization implement AI within recruitment process. The previous literature reviews that have investigated the AI-based recruitment process, although similar in nature, they offer different methodologies and perspective to consider.

For instance, the most recent bibliometric analysis conducted by (Hunkenschroer & Luetge, 2022), reviewing 51 academic articles that met their specified criteria, focusing on the extant on the ethicality of AI-enabled recruiting by mapping the ethical opportunities, risks, and ambiguities between year 2016 to 2020. Second, (FraiJ & László, 2021) reviews 21 articles collected in 2010 until 2020 analyses the implementation of AI for evaluating the human bias to find the best fit candidate in screening process. The similar literature that explores the level, rate and potential AI adoption for the hiring process (Black & van Esch, 2020).

Our study focuses on how the AI implementation in the recruitment process by collecting data in year 2001-2022 with the consideration that AI began to be widely used during this time.

RESEARCH METHOD

This section will explain the Systematic Literature Review used in the study. Referring to the PRISMA Flow Diagram presented in figure 1, there are 4 stages of review process that should be done, including: 1) identification; 2) screening; 3) eligibility; and 4) analysis. Each stage explained as follows.

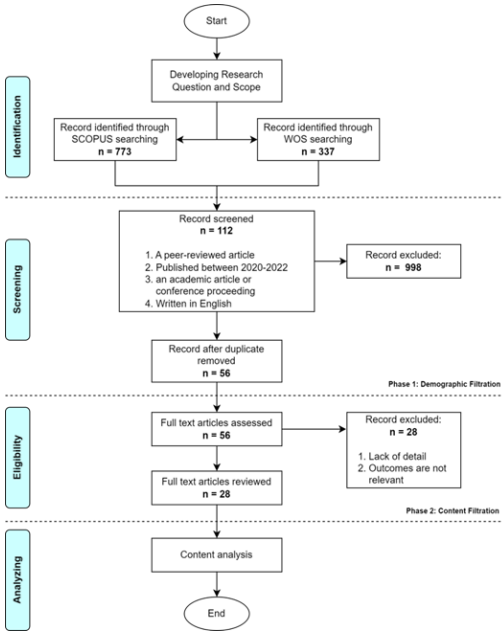

Figure 1. SLR Method Using PRISMA Flow Diagram

Identification Process

The identification process begins with defining research questions and objectives on knowing the impact of AI on the recruitment process. After the boundaries and research objectives are defined, the second step is the article collection stage. We use two database sources, Scopus and Web of Science. To get specific articles, we use 3 strings, which relates to AI, HRM, and Recruitment. Details of the string can be seen in Table 1. The articles extractions using the keyword search in Table 1 resulting 1.110 articles in total.

Table 1. AI, HRM, and Recruitment Keyword Search

Topic	String
Artificial Intelligence	(“AI” OR “Artificial Intelligence” OR “Machine Learning” OR “Deep Learning” OR “Neural Network”)
Human Resource Management	(“Human Resource Management” OR “HRM” OR “Human Resource Information Systems” OR “HRIS” OR “Human Resource” OR “HR” OR “Human Resource Management Systems” OR “HMRS”)
Recruitment	(“Recruitment” OR “Recruiting” OR “Selection” OR “Selecting” OR “Hiring” OR “Outsource” OR “Outsourcing”)

Screening ***Process***

Following (Votto, Valecha, Najafirad, & Rao, 2021), we conduct this review in 2 phases. First phase is called the Journal Demographic Filtration screening process. Upon screening our databases, we established our inclusion and exclusion criteria for Phase 1. The criteria consist of 9 factors (4 for inclusions, 5 for exclusions). The article must be peer-reviewed, written in English; published between 2008-2022, academic articles or conference proceedings. The exclusion of literature occurs if it is not written in English, not peer-reviewed or non-academic, and an editorial or simulation piece, published before year 2001, and duplicated articles between two databased. Out of more than a thousand articles, only 56 articles pass our screening process.

Eligibility Process

Once the journal verification state is completed, we continue to conduct phase 2: the content filtration phase. The inclusion and exclusion criteria of this phase consist of two steps. In the first step, we review the title, abstract and associated keywords of the articles to see if they match our pre-established definitions of AI, HRM, and recruitment. In step 2, we do a thorough review on the full paper to ensure all papers are relevant to the topic. Out of the 56 articles under review, 28 of them are selected to be included in our study.

Analyzing

All articles that have been selected from phase 2, then will be carried out the content analysis. The findings will be discussed in the next section, including research gaps, research limitations, and future research opportunities.

RESULT AND DISCUSSION

The results in Table 2 shows that 2021 and 2022 are the most productive years, with a total of 9 papers. While for the second rank in 2020 there were 8 papers, for the third rank in 2019 there were 5 papers. This evidence suggests that the investigation of artificial intelligence in recruitment is increasing through years. Based on the number of papers obtained, it shows that research related to artificial intelligence in recruiting has not been carried out much.

Table 2. Trends of Publications

No	Year	Publications
1	2022	9
2	2021	9
3	2020	8
4	2019	5
5	2010	2
6	2008	1
7	2001	1

Several countries have published studies on artificial intelligence in recruitment. And we look at the outputs and effects of the most prominent countries between 2001 and 2022. Table 4 displays the publications from the top 4 countries regarding artificial intelligence in recruitment.

Table 3. The most productive countries and regions

Rank	Countries/ Regions	Publications	Citations
1	United states	8	164
2	New Zealand	4	114
3	Germany	4	80
4	India	4	10

The most active sources in AI research in recruitment are listed in Table 4. Business Horizon is the top journal, with 3 publications and 111 citations. Decision Support System is placed in the second with 2 publications and 93 citations, whilst International Journal of Resource Management is placed in the third with 2 publications and 76 citations.

Table 4. Top sources that published Green Production in Agricultural Industry

Rank	Source	Publications	Citations
1	Business Horizon	3	111
2	Decision Support System	2	93
3	International Journal of Human Resource Management	2	76

The spread and evolution of research themes can identify research hotspots and research changes over different periods. Given that keywords are a natural language vocabulary for conveying subjects and concentrated concepts of the literature, a keyword analysis can indicate research hotspots and the evolution of trends from applicable study disciplines. Table 5 shows that next to the keyword "Artificial Intelligence", the keyword that appears most often is "Human Resource Management", "Recruitment", "Human Resource", and "Machine Learning". This shows that the keyword is a current research hotspot.

Table 5. High - Frequency Keyword

Sequence number	High – Frequency Keyword	Frequency
1	Artificial Intelligence	19
2	Human Resource Management	9
3	Recruitment	8
4	Human Resource	7

5	Machine Learning	5

Organizational recruitment is driven by the goal of attracting qualified individuals and motivating them to apply for jobs (Breaugh, 2008). In the beginning, almost every recruitment activity is carried out in traditional fashion, consisting of a screening stage (involving CVs and standardized tests that HR professionals evaluated) and an interview stage (in which senior managers assessed candidates based on a group interview and made final hiring decisions) are done manually (van den Broek, Sergeeva, & Huysman, 2021). With the introduction of the AI technology, the screening stage is substituted by software, which can automatically select and predict candidates' fit with the organization based on the job specifications. The comparison of traditional recruitment and AI-based recruitment can be seen in figure 2.

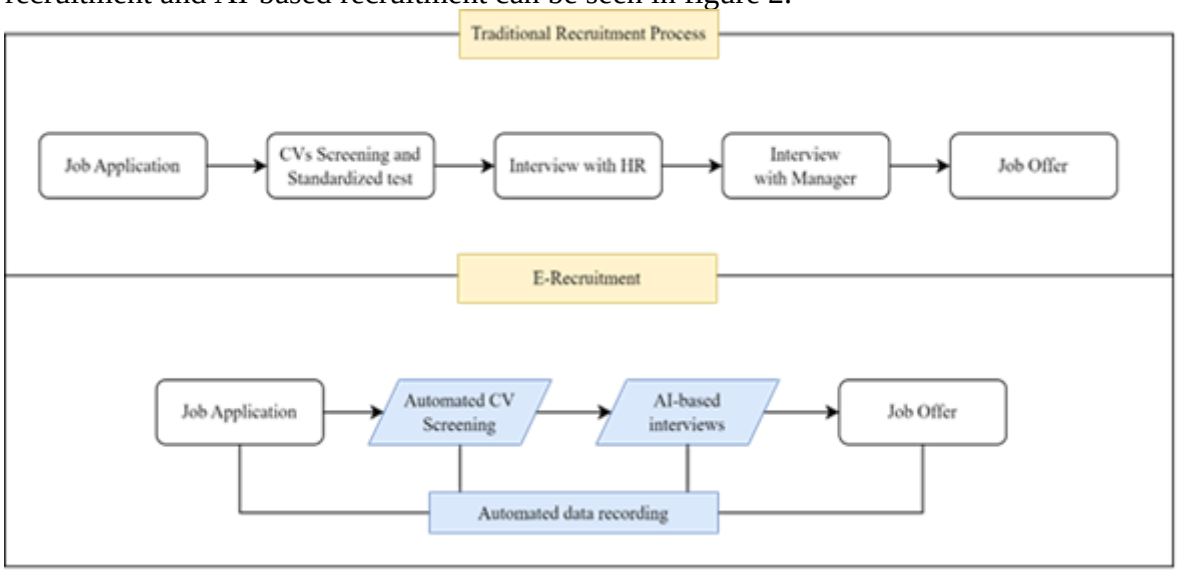

Figure 2. Recruitment Process Comparison

Candidates who will be predicted to be a good fit (i.e., who matched the attributes of high-performing employee) are selected by the algorithm for the interview stage (van den Broek et al., 2021). Relevant to that, the interview process now can be done virtually, with the respect of AI-based interview software. This process involving AI is known as e-recruiting. E-recruiting is defined as the use of communication technologies, such as websites and social media, to find and attract potential job applicants, to keep them interested in the organization during the selection process, and to influence their job selection decisions (Johnson, Stone, & Lukaszewski, 2020). E-Recruiting is an extensive of AI used in the traditional Breaugh recruitment process, specifically in third stage.

The Implication of AI in Recruitment Process

Enlarging the Applicant Pool

AI helps to enlarge the talent pool and attract applicants who fit with the organization. By listing openings on recruitment websites, applicants can easily access them any time of the day or night. Organizations have found that the use of e-recruitment has led to a much larger applicant pool than traditional recruitment processes (Chapman & Gödöllei, 2017). For example, collected from (Black & van Esch, 2020), Johnson & Johnson generated over 1 million applications for 28,000

positions in 2017. In the same year, Google also generated an estimated 2 million applications for just 14,500 jobs, meaning that it was nearly 10 times more difficult to get a job at Google than to get into Harvard University (Alic, 2016).

Enhancing Efficiency and Timeliness

(Chilunjika, Intauno, & Chilunjika, 2022) discovers that AI benefits the recruiter when it comes to cutting down administrative tasks routine like answering the regular questions. This is possible by using AI-powered chatbots that focus on communication, implementing predictive behavior, and responding to questions and requests via text and speech. In that regard, employees can work in more meaningful roles because AI frees up their time to concentrate on what really needs to be done. Automation does not replace a team or service but rather supplements it to make it completely user-centric (Chilunjika et al., 2022). Niehueser & Boak, (2020) concludes that the implementation of AI di Cielo, a leading outsourcing organization, has significantly reduced the time taken to process each individual application to the scheduled interview with a hiring manager, from up to two weeks, when many of the processes are carried out manually, to an average of seven minutes when using AI. Thus, AI's ability to reduce time-to-hire represents not just an efficiency gain but also potentially a strategic advantage in the battle for human capital, especially in industries in which there is high turnover (Alic, 2016).

Reducing Cost of Recruitment

One of the biggest challenges facing organizations is identifying highly qualified applicants from their large pools (Johnson et al., 2020) and AI recruitment has a dual effect on total cost minimization. AI-enabled process automation can assist the screening task by using algorithms to identify profiles of talented applicants and select the ones who should be invited for interviews. AI can also generate letters to applicants indicating if they are qualified or not qualified for jobs, and provide them with information about the next steps in the process. The standardization of the initial screening process can improve its efficiency, enhance the fairness of the process and ensure that organizations recruit the most effective applicants (Johnson et al., 2020). Thus, AI adoption can reduce the production costs of companies by saving on human capital, because it can perform tasks that would usually require HR professionals (Pan, Froese, Liu, Hu, & Ye, 2022).

Best Fit Candidate

AI helps to identify and narrow down candidate pool through resume scanning (Dickson & Nusair, 2010). It also analyzes the turnover rates and accordingly select the best candidate for the job (Chakraborty, Giri, Aich, & Biswas, 2020). AI also helps in evaluating a candidate's performance in a job interview and in choosing the right person for the job. For example, Unilever is using an algorithm-based recruiting strategy for prescreening candidates and gathering evidence for choosing the right person before the interview phase (Stanley & Aggarwal, 2019). AI also can be adopted in virtual interview process. (Chakraborty et al., 2020) states when audio visual interviews are taken using AI software, the candidate's choice of word, speech, body language, personality traits are assessed. This helps the HR team to easily decide the job role of that candidate. AI also eases the work of HRM by constantly updating employees about information, suggestions and feedbacks (Chakraborty et al., 2020).

AI-enabled Decision Making

The fundamental idea of decision making by AI consists of developing a set of decision rules based on existing data sets, the so-called training data (Hauer, Kevekordes, & Haeri, 2021). For example, organizations can merge information gathered from job applications, employment tests, personality inventories and interviews, and AI can develop algorithms that weight and combine the information to make overall hiring recommendations. The use of AI should be very beneficial in this process because it does not include biases or affect reactions to applicants, which often mislead decision-making (van Esch & Black, 2019). Industry research supports this argument, finding that AI enabled hiring decisions result in a 20% increase in employee performance and a 35% decrease in turnover rates (Johnson et al., 2020). Thus, the use of AI algorithms may make more effective selection decisions than traditional decision-making, but research is needed to examine this prediction

CONCLUSION

The purpose of this research is to review the integration of AI in HRM components, especially in the recruitment process. The main advantage of using AI is the speed and quality of work as well and minimizing daily tasks with their use in the recruitment process. Using AI can help organizations expand the pool of applicants, improve timeliness, increase efficiency in the recruitment process, increase the attractiveness of applicants to the organization and can also improve the suitability assessment between employee candidates and the organization. In addition, recruiting using AI has a dual effect on minimizing total costs. AI tools also help in evaluating a candidate's performance in a job interview and in choosing the right person for the job.

BIBLIOGRAPHY

Albert, Edward Tristram. (2019). AI in talent acquisition: a review of AI-applications used in recruitment and selection. *Strategic HR Review*, *18*(5). https://doi.org/10.1108/shr-04-2019-0024

Alic, Birca. (2016). Talent Recruitment and Selection – Issue and Challenge for Organizations in the Republic of Moldova. *Annals-Economy Series*, *1*.

Aula, Shofia, Hanoum, Syarifa, & Prihananto, Prahardika. (2022). Peran Manajemen Sumber Daya Manusia dalam Meningkatkan Resiliensi Organisasi: Sebuah Studi Literatur. *Jurnal Sains Dan Seni ITS*, *11*(1), D143–D148.

Black, J. Stewart, & van Esch, Patrick. (2020). AI-enabled recruiting: What is it and how should a manager use it? *Business Horizons*, *63*(2). https://doi.org/10.1016/j.bushor.2019.12.001

Breaugh, James A. (2008). Employee recruitment: Current knowledge and important areas for future research. *Human Resource Management Review*, *18*(3). https://doi.org/10.1016/j.hrmr.2008.07.003

Chakraborty, Smita, Giri, Arunangshu, Aich, Abanti, & Biswas, Swatee. (2020). Evaluating influence of artificial intelligence on human resource management using PLS-SEM (Partial least squares-structural equation modeling). *International Journal of Scientific and Technology Research*, *9*(3).

Chapman, Derek S., & Gödöllei, Anna F. (2017). E-Recruiting: Using Technology to Attract Job Applicants. *The Wiley Blackwell Handbook of the Psychology of the Internet at Work*.

Chilunjika, Alouis, Intauno, Kudakwashe, & Chilunjika, Sharon R. (2022). Artificial intelligence and public sector human resource management in South Africa: Opportunities, challenges and prospects. *SA Journal of Human Resource Management*, *20*, 1–12. https://doi.org/10.4102/sajhrm.v20i0.1972

Dickson, Duncan R., & Nusair, Khaldoon. (2010). An HR perspective: The global hunt for talent in the digital age. *Worldwide Hospitality and Tourism Themes*, *2*(1). https://doi.org/10.1108/17554211011012612

FraiJ, JihaD, & László, Várallyai. (2021). literature Review: Artificial Intelligence Impact on the Recruitment ProcessA Literature Review: Artificial Intelligence Impact On The Recruitment Process. *International Journal of Engineering and Management Sciences*, *6*(1). https://doi.org/10.21791/ijems.2021.1.10.

Hauer, Marc P., Kevekordes, Johannes, & Haeri, Maryam Amir. (2021). Legal perspective on possible fairness measures – A legal discussion using the example of hiring decisions. *Computer Law and Security Review*, *42*. https://doi.org/10.1016/j.clsr.2021.105583

Hunkenschroer, Anna Lena, & Luetge, Christoph. (2022). Ethics of AI-Enabled Recruiting and Selection: A Review and Research Agenda. *Journal of Business Ethics*, Vol. 178. https://doi.org/10.1007/s10551-022-05049-6

Johnson, Richard D., Stone, Dianna L., & Lukaszewski, Kimberly M. (2020). The benefits of eHRM and AI for talent acquisition. *Journal of Tourism Futures*, *7*(1). https://doi.org/10.1108/JTF-02-2020-0013

Nawaz, Nishad. (2019). How Far have we come with the study of artificial intelligence for recuritment process. *International Journal of Scientific and Technology Research*, *8*(7).

Niehueser, Wilfried, & Boak, George. (2020). Introducing artificial intelligence into a human resources function. *Industrial and Commercial Training*, *52*(2). https://doi.org/10.1108/ICT-10-2019-0097

Pan, Yuan, Froese, Fabian, Liu, Ni, Hu, Yunyang, & Ye, Maolin. (2022). The adoption of artificial intelligence in employee recruitment: The influence of contextual factors. *International Journal of Human Resource Management*, *33*(6). https://doi.org/10.1080/09585192.2021.1879206

Rai, Ni Gusti Made, Silmina, Nabila, Fitrananda, Helmi, Hanoum, Syarifa, Sinansari, Puti, & Noor, Bustanul Arifin. (2022). The Effect of work Conflict and Job Stress on The Human Resources Performance (Case Study: Maintenance & Engineer Division at PT. Paiton Operation & Maintenance Indonesia). *Proceedings of the 3rd International Conference on Business and Management of Technology (ICONBMT 2021)*, *202*(Iconbmt), 305–309. https://doi.org/10.2991/aebmr.k.211226.042

Stanley, Deborah Sharon, & Aggarwal, Vaneeta. (2019). Impact of disruptive technology on human resource management practices. *International Journal of Business Continuity and Risk Management*, *9*(4). https://doi.org/10.1504/ijbcrm.2019.10021173

Tambe, Prasanna, Cappelli, Peter, & Yakubovich, Valery. (2019). Artificial intelligence in human resources management: Challenges and A path forward. *California Management Review*, *61*(4). https://doi.org/10.1177/0008125619867910

Upadhyay, Ashwani Kumar, & Khandelwal, Komal. (2018). Applying artificial intelligence: implications for recruitment. *Strategic HR Review*, *17*(5). https://doi.org/10.1108/shr-07-2018-0051

van den Broek, Elmira, Sergeeva, Anastasia, & Huysman, Marleen. (2021). When the machine meets the expert: An ethnography of developing ai for hiring. *MIS Quarterly: Management Information Systems*, *45*(3). https://doi.org/10.25300/MISQ/2021/16559

van Esch, Patrick, & Black, J. Stewart. (2019). Factors that influence new generation candidates to engage with and complete digital, AI-enabled recruiting. *Business Horizons*, *62*(6). https://doi.org/10.1016/j.bushor.2019.07.004

Votto, Alexis Megan, Valecha, Rohit, Najafirad, Peyman, & Rao, H. Raghav. (2021). Artificial Intelligence in Tactical Human Resource Management: A Systematic Literature Review. *International Journal of Information Management Data Insights*, *1*(2). https://doi.org/10.1016/j.jjimei.2021.100047

Wedhatama, Odrifaza Girindra, Hanoum, Syarifa, & Prihananto, Prahardika. (2021). Studi Bibliometrik pada Penelitian Manajemen Sumber Daya Manusia Di Bidang Perawatan Kesehatan (Healthcare). *Jurnal Sains Dan Seni ITS*, *10*(1). https://doi.org/10.12962/j23373520.v10i1.60391