

THE USE OF ARTIFICIAL INTELLIGENCE IN THE RECRUITMENT PROCESS

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ABSTRACT

Redesigning artificial intelligence algorithms to support an efficient, balanced, and objective hiring process is becoming a critical step in achieving and maintaining a competitive advantage in the labor market. This paper aims to highlight the importance of stored data and information generated by individuals, whose neutrality and objectivity cannot always be determined, and which, as such, influence AI algorithms. In this context, the potential ethical and discriminatory implications of using AI in attracting and selecting qualified candidates are examined. The paper underscores the relevance of implementing artificial intelligence in human resource management by promoting fairness, inclusivity, and employee well-being while minimizing potential legal and ethical risks. Its contribution lies in advocating for AI adoption across all stages of the hiring process, while also encouraging both employers and job seekers to maximize AI's potential to achieve their respective goals. To reinforce ethical standards and principles, the paper addresses the issue of assigning responsibility and certifying practitioners, thereby fostering long-term sustainability and broader societal well-being. Theoretical and practical significance is reflected in the paper's conceptualization as a stable foundation for future scientific and research advancements on the impact and application of artificial intelligence in employment processes.

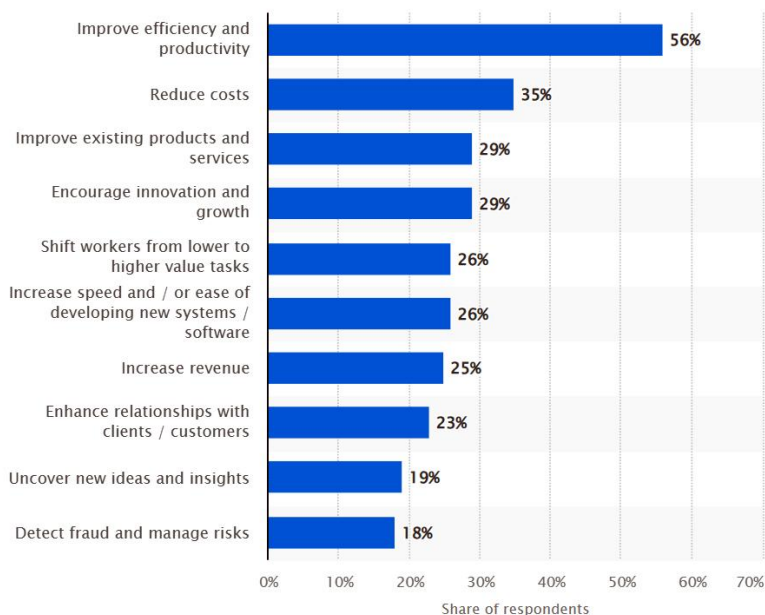
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INTRODUCTION

The business landscape and labor market are confronting numerous unprecedented challenges, driven by the rapid development of information and communication technologies, the disappearance of once-traditional professions, and the emergence of new ones. Among the various business, legal, and ethical challenges, the use of artificial intelligence stands out as a leading concern. As it becomes increasingly difficult to find candidates whose competencies align with the requirements of vacant positions, AI plays a crucial role in the recruitment process. In this context, the speed at which potential candidates are identified and attracted has become a key factor in maintaining an organization's competitive advantage. This is precisely why the use of artificial intelligence in recruitment is becoming more frequent and comprehensive. By automating numerous activities within the hiring process, AI enables more efficient decision-making, ensuring that the most suitable candidates are given the opportunity to build their careers.

Using new technology, particularly electronic human resource management (E-HRM) as a key tool, organizations can automate numerous manual tasks, enhance data accuracy, and increase overall efficiency. This automation allows HR professionals to shift their focus toward strategic initiatives and talent development. (Gabriel et al., 2024) Artificial intelligence is an increasingly influential technology with applications in modeling complex economic systems, forecasting economic indicators, conducting predictive analytics, supporting decision-making, managing trade and supply chains, and overseeing investments. Additionally, AI fosters innovation and contributes to improving product quality, further enhancing its impact on the economy. (Baltezarević, 2023)

Globally, nearly 60% of organizations anticipate that implementing generative AI will enhance efficiency and productivity. The most frequently cited benefits include cost reduction (35%), improvement of existing products and services (29%), and driving innovation and growth (29%). (Statista, 2024)



Graph 1. Key benefits global organizations hope to achieve with the adoption of generative artificial intelligence (AI) as of 2024 (Statista, 2024).

LITERATURE REVIEW

The process of attracting, identifying, selecting, and integrating candidates is both costly and time-consuming, with poor hiring decisions potentially leading to significant repercussions. To mitigate these challenges, companies are increasingly leveraging the Internet and software technologies to manage applications and evaluate candidates. The integration of artificial intelligence (AI) in recruitment helps minimize decision-making errors and makes the process more cost-effective.

Karaboga and Vardarlier (2020) examined AI usage in recruitment within Turkish companies. Their findings indicate that while AI has value in recruitment, it primarily serves as a supplementary tool rather than a central one. Companies tend to use AI either minimally or not at all, mainly due to concerns that AI may lead to inaccurate candidate assessments.

A study by Marina Budić (2023) conducted in Serbia explored various aspects of AI adoption, revealing public concerns over job losses, the disappearance of certain professions, and potential discrimination by AI systems. The author emphasizes the need for public education on these challenges and strategies to address them. However, other research suggests that HR managers should not view AI recruitment tools as a threat to their roles. Instead, successful recruitment requires collaboration between human resources and AI, with ongoing oversight of AI technologies. (Tsiskaridže et al., 2023)

The existing literature tends to emphasize the negative implications of AI in the hiring process, often portraying robots as process innovations while overlooking the positive effects AI can have on employment. Niame, Damioli et al. (2023) highlight several empirical studies demonstrating that product innovations drive job creation by generating new employment

opportunities in areas such as data processing, transactional procedures, customization, and remote collaboration.

A survey of 297 Chinese companies found that perceived complexity regarding AI adoption acts as a barrier, while technological competence and regulatory support facilitate its implementation. However, factors such as AI's relative advantages, company size, and industry type were not found to have a significant impact on AI adoption. (Pan et al., 2021)

Ligeiro et al. (2024) explored the relationship between organizational attractiveness, intrinsic motivation, perceived novelty, trust in the process, and the intention to adopt, engage in, and complete an AI-assisted recruitment and selection process. Their study, based on a sample of 299 participants from Portugal, revealed that organizational attractiveness and perceived novelty were positively and significantly associated with applying for, engaging in, and completing an AI-assisted recruitment process among participants aged 45 to 54. For those aged 35 to 44, trust in the process played a significant role in their intention to apply and complete an AI-assisted recruitment and selection process.

Sančanin and Penjišević (2024) highlight that under the strong influence of geopolitical challenges, economic turbulence, and negative demographic trends, the labor market is evolving rapidly, reshaping the demand for future professions. Additionally, the authors caution that legal and ethical frameworks struggle to keep pace with the speed and variability of macrorends driven by technological advancements, leading to the emergence of new professions and the decline of existing ones.

Building on the Technology Acceptance Model (TAM), Almeida et al. (2025) developed a framework explaining the intention to adopt AI tools. Their findings suggest that perceived ease of use and perceived usefulness shape attitudes toward AI, which in turn influence the willingness to integrate AI tools into recruitment and selection processes. A qualitative study, based on 100 interviews with recruiters who regularly use AI tools, underscored AI's transformative role in recruitment, emphasizing its potential to enhance efficiency and optimize resource management. Meanwhile, a quantitative study using an online questionnaire completed by 355 recruiters revealed concerns about the potential loss of personal interaction and the need for role adaptation within recruitment. The findings suggest that AI is most effective as a complementary tool rather than a replacement for human decision-making.

KEY AI TECHNOLOGIES IN EMPLOYMENT

In a dynamic and ever-evolving labor market, there is often a shortage of qualified unemployed professionals. As a result, employers must accelerate, simplify, and reduce the costs of identifying and selecting candidates whose competencies align with job requirements. In this context, the key reasons for integrating artificial intelligence (AI) into the recruitment process are emphasized (Oorwin, 2024):

AI in candidate sourcing: AI tools analyze vast amounts of data to identify potential candidates more efficiently than traditional methods.

Resume analysis and screening: AI streamlines the identification of candidates with the right education, skills, and experience, reducing manual review time and allowing recruiters to focus on hiring top talent.

Chatbots for candidate engagement: AI-powered chatbots handle routine inquiries through personalized interactions, freeing managers to focus on strategic goals and enhancing recruitment efficiency.

AI in interview scheduling: Intelligent systems analyze calendars, suggest optimal meeting times, and manage scheduling changes, accelerating the process and improving the candidate experience.

Predictive analytics in hiring: AI evaluates patterns from past hiring cycles to forecast hiring outcomes, enabling more data-driven decision-making.

Video interview analysis: AI assesses candidates' verbal and nonverbal communication, including facial expressions, body language, and speech patterns, providing deeper insights into their abilities.

By incorporating AI into these recruitment processes, companies can improve efficiency, enhance candidate experiences, and optimize talent acquisition strategies.

While it may be too ambitious to quantify all the benefits of artificial intelligence in the hiring process from today's perspective, a report on the future of work, based on insights from 800 global leaders, highlights key expectations (Rayner, 2023):

AI will drive job creation: AI is expected to generate a net increase in jobs over the next five years, with nearly a quarter of existing jobs being replaced by new roles. The automotive industry is projected to experience the highest employment growth, while only four of the 27 industries studied anticipate net job losses, with oil and gas workers being the most vulnerable.

Companies will prioritize AI skills: Among the 25 most critical soft and hard skills in the workplace, AI and big data rank as the top priorities, particularly for companies with more than 50,000 employees. Future public-private collaboration in AI skills training is also expected to play a key role in boosting productivity.

Tasks will be augmented, not fully automated, by AI: Currently, 34% of tasks are automated, and expectations for future automation have been adjusted, with an additional 9% of operational tasks predicted to be automated over the next five years. Research suggests that most management skills are more likely to be enhanced rather than fully automated by AI.

Beyond its potential to improve the recruitment process, AI-driven technology also raises important considerations for organizations evaluating and implementing AI-based hiring solutions. Comparing candidate interview experiences across four key factors—performance anxiety, environmental fit, confidence, and comfort level—Selim Balcioglu and Artar (2024) found that AI-assisted interviews provide a more positive experience for candidates.

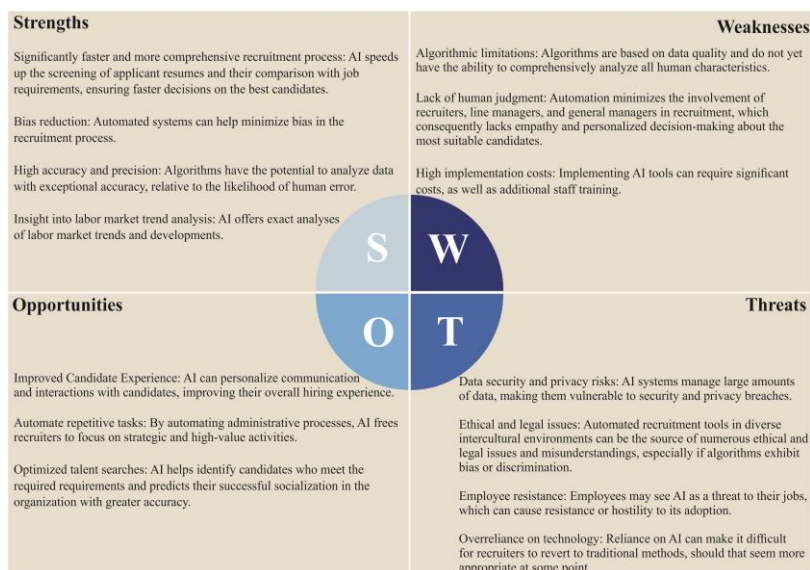


Figure 1. SWOT analysis: employment with the application of artificial intelligence.

In general, the benefits of applying artificial intelligence in the hiring process can be categorized into four key dimensions:

- Quantitative and qualitative improvement of hiring – AI enhances both the efficiency and accuracy of candidate selection.
- Improved integration of advanced analytics – AI enables deeper data-driven insights, optimizing hiring strategies.
- Enhancing hiring through automation – AI streamlines recruitment by automating repetitive tasks, reducing time and costs.

- Driving unbiased decision-making in hiring – AI helps minimize human bias, promoting fairer and more objective candidate evaluations.



Figure 2. Benefits of Using Artificial Intelligence (AI) in Recruitment.

ETHICAL ISSUES OF AI IN RECRUITMENT

High-risk AI systems have the potential to directly or indirectly violate ethical principles, though this is not always the case. However, their development, application, and use raise concerns about ensuring AI remains reliable and responsible. A reliable and responsible AI system is one that is technically stable and safe—one that *“does not allow the processes in which the AI system participates to endanger or marginalize humans, nor does it violate freedom of action, thought, and decision-making to the extent that the rights and achievements preserving these values are rendered meaningless, diminished, or forgotten”* (Official Gazette of the Republic of Serbia, 23/2023).

Christoforaki and Beyan (2022) define AI ethics as a multidisciplinary field encompassing philosophical, legal, social, and technological aspects, aiming to examine their interactions. By considering these dimensions together, the authors argue that a deeper understanding emerges, enabling more effective responses to the challenges posed by the widespread adoption of artificial intelligence, particularly in sensitive fields such as healthcare.

Many of the biases inherent in humans can be transferred to AI, posing a persistent challenge as AI continues to rely on the data it processes and utilizes. This raises an important question from the outset: Who bears responsibility—the data owner, the user, or the developer? Equally critical is determining how to establish ethical standards at national, regional, and global levels in a way that ensures universal acceptance and applicability.

While understanding and embracing AI ethics require long-term, sustained efforts, initial steps have already been taken to provide guidance. In late 2018, the Monetary Authority of Singapore (MAS), in collaboration with Microsoft and Amazon Web Services, introduced the FEAT principles for AI governance: Fairness, Ethics, Accountability, and Transparency. Effective governance, along with robust legislation and regulatory frameworks, is essential for enforcing these ethical principles and ensuring compliance. (Siau & Wang, 2020)

Figure 3 presents a framework for AI ethics, outlining key factors that must be considered when defining ethical guidelines for artificial intelligence.

There is a common belief that applying artificial intelligence in the recruitment process leads to greater objectivity, neutrality, and fairness. However, the evidence does not fully support this claim. In practice, HR professionals involved in recruitment and selection have little control over the attributes that form the data sources AI relies on. As a result, these datasets may contain biases, making AI-driven hiring decisions vulnerable to unintended consequences.

As the BBC (2023) notes, *“if artificial intelligence learns from a dataset that is biased—whether in terms of race, gender, or other factors—it has the potential to reinforce and propagate inaccurate, offensive stereotypes.”* Recognizing these risks, Mujtaba and Mahapatra (2019) explored bias mitigation, fairness, and the promotion of ethical AI algorithms in hiring. Their research highlights the growing use of AI in HR applications such as candidate screening, resume

parsing, and employee turnover prediction. While AI can improve efficiency and reduce some biases through automation, it ultimately depends on human-generated data, meaning human biases can still be embedded in its decision-making processes.

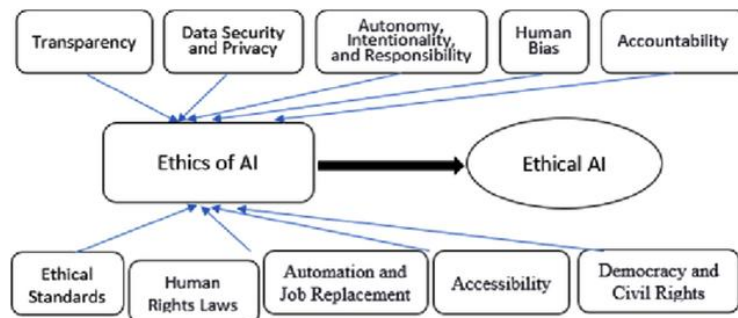


Figure 3. AI Ethics: Framework of building ethical AI (Siau & Wang, 2020).

Drage and Mackersth (2022) examined two key claims made by AI recruitment companies regarding the development and implementation of AI-powered HR tools: (1) AI recruitment can objectively assess candidates by removing gender and race from its systems, and (2) this removal will lead to fairer hiring. The authors argue that these claims are flawed for four reasons:

- The notion of removing gender and race from AI systems reflects a misunderstanding, treating them as isolated attributes rather than deeply embedded systems of power.
- Shifting "diversity work" to other AI recruitment tools risks reinforcing a culture of inequality and discrimination within organizations.
- The supposedly neutral assessment of candidates by AI tools overlooks the inherent power dynamics between the observer and the observed. Specifically, racial history influences how traits are analyzed and aligned with current labor market demands.
- AI recruitment tools do not merely identify the "ideal candidate"; they actively shape this ideal by constructing associations between language, behavior, and identity.

While AI offers many benefits in recruitment, ethical concerns arise when integrating it into organizations. A study by Gupta and Mishra (2022) highlights significant ethical issues, particularly bias. Since AI algorithms rely on input data, they can reflect the subconscious biases of their programmers. Additionally, AI has revived concerns about privacy and data protection.

The future of AI depends on its responsible and ethical use, requiring continuous trust-building and proactive risk management. Standardizing and ensuring transparency in AI-generated data can foster public trust and confidence. Otherwise, AI's immense potential to improve quality of life could be misused, turning it into a harmful tool instead of a beneficial one (Sančanin & Penjišević, 2022).

CONCLUSIONS

Although artificial intelligence cannot be considered entirely impartial in the recruitment process—since existing data and information reflect the subjectivity of their creators—it offers numerous innovative solutions.

First and foremost, AI algorithms identify candidates with the required competencies more quickly and accurately, allowing human resources managers to dedicate more time to applicants with the right knowledge, abilities, and skills. Additionally, AI-assisted recruitment has streamlined and accelerated the application process for job seekers. However, it has also made it easier for unqualified candidates to apply, significantly more than in conventional hiring methods. Fortunately, AI algorithms filter out such candidates at the preliminary stage by verifying whether they meet the formal requirements.

With the automation of the entire recruitment process, recruiters are relieved of administrative burdens, while candidates benefit from a significantly improved experience. This, in turn, positively impacts the employer's reputation, reinforcing their image as a desirable workplace.

Since most studies examine the role of artificial intelligence in recruitment from the perspective of employers, a shift in focus is needed to place job seekers at the center of attention. Moreover, accountability in AI-driven recruitment must be individualized to prevent unethical practices.

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper.

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