

THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE EMPLOYEE RECRUITMENT PROCESS

Elżbieta WAŻNA

Pomeranian University of Starogard Gdański; elzbieta.wazna@twojestudia.pl, ORCID: 0000-0002-9774-4376

Purpose: The main purpose of this article is to explore the role and importance of artificial intelligence in the employee recruitment process, with a particular focus on the impact of AI technology on the effectiveness and efficiency of recruitment management. The research objective formulated in this way aims to answer the question of whether artificial intelligence is able to provide a more effective recruitment process and minimize the risk of overlooking potential talent

Design/Methodology/Approach: The methodology of the study consists of a descriptive part on the typology of artificial intelligence and modern systems used in the process of recruiting employees in companies. The empirical part was helped by questionnaire surveys which were conducted in companies use modern recruitment methods.

Findings: Artificial intelligence is profoundly shaping economic and social dynamics, and its influence will continue to grow. The effective use of this technology has the potential for dynamic growth in various sectors, including finance. Faster sourcing of the best talent, accurate matching of candidates' skills and optimization of HR operations are just some of the benefits of automation.

Practical implications: The added value resulting from the conducted studies confirms that financial investments on capital markers of emerging countries can be an excellent alternative to the traditional financial instruments characterized by a meager rate of return.

Originality/value: The originality and innovativeness of this study has two dimensions, namely, analytical - consisting in the evaluation of modern systems of the recruitment process - indicating new opportunities for both HR professionals and employers using the innovative opportunity that is artificial intelligence.

Keywords: artificial intelligence recruitment process, management, selection, employee.

1. Introduction

With today's challenges facing businesses, competition for talent is becoming more difficult. Companies are competing not only for customers and markets, but also for outstanding employees who are key elements of organizational success. Therefore, employee selection

recruitment processes are becoming strategically important for maintaining competitiveness and achieving business goals (Michna, Grygiel 2015).

With the rapid development of technology, revolutionary changes can be seen in the field of human resource (HR) management, and recruitment processes are no exception. Modern technology and automation tools are increasingly shaping the way organizations select and hire new employees.

Selection of competent employees is one of the basic tasks of human resource management. It is a set of activities aimed at attracting the right people to the organization and bringing about the proper filling of vacant jobs to ensure the continuous and smooth functioning of the organization (Listwan, 2010). The selection process is carried out by recruitment and selection, that is, to seek and interest candidates in a job offer, check their suitability, then select the best candidate (Kardas, Multan, 2012). Increasingly, the recruitment of new employees is being done using tools that enable remote communication (Pabian, 2020) and using advanced technologies such as data analytics to ensure efficiency, service effectiveness and savings in human resource management and artificial intelligence (Migon, 2024).

Artificial intelligence is an extremely important topic, both in the context of corporate hiring and in the recruitment and selection process. Through the use of modern technology, AI has the potential to significantly increase the efficiency, objectivity and personalization of recruitment processes in various sectors. Properly implemented, AI-based solutions can dramatically change the approach to recruitment, benefiting both employers and candidates seeking employment. The added value of this article is the analysis to provide readers with valuable information and practical tips for applying artificial intelligence to their own recruitment processes.

The main objective of this article is to explore the role and importance of artificial intelligence in the employee recruitment process, with a particular focus on the impact of AI technology on the effectiveness and efficiency of recruitment management. In writing the article, it was decided to test the following research hypothesis: The introduction of artificial intelligence into the recruitment management process contributes to the effectiveness and relevance of employee selection. Addressing the issue seems to the author to be as timely as possible from both the employee and employer side. In addition, the use of AI enables a better match between candidates' skills and job requirements, resulting in higher levels of satisfaction and efficiency in the workplace.

Despite its widespread use, the definition of “artificial intelligence” remains difficult to grasp, mainly due to the ambiguity of the concept of intelligence itself. Different researchers have proposed different definitions, ranging from the general ability to adapt to new conditions and perform new tasks to the ability to perceive dependencies and relationships, learn and creatively process information.

The term “artificial intelligence” was formally introduced and defined by John McCarthy in 1955. The author of the term defined it as “the science and engineering of creating intelligent machines”. Since then, many definitions have emerged, reflecting the multifaceted nature of artificial intelligence. These definitions include the notion of machines exhibiting aspects of human thinking, including learning from mistakes, reasoning and interacting with the environment (Rózanowski 2007). The PWN Dictionary of the Polish Language defines artificial intelligence as “a branch of computer science that studies the rules governing the behavior of human minds and create computer programs or systems that simulate human thinking.

Artificial intelligence is a multidisciplinary field that includes knowledge base systems, expert systems, image recognition, natural language understanding, robotics and more. Its goal is to mimic human intelligence in machines, enabling them to autonomously adapt to changing conditions, make complex decisions and learn autonomously.

There are currently two dominant approaches to artificial intelligence: weak artificial intelligence and strong artificial intelligence. Weak artificial intelligence focuses on developing systems that simulate human cognitive functions to help solve problems and make decisions. Strong artificial intelligence aims to create machines with intelligence comparable to humans, capable of self-instruction and complex reasoning (Rózanowski, 2007).

There is no single, universally accepted definition of artificial intelligence. For the purposes of this paper, I adopt the definition proposed in the European Parliament report. Artificial intelligence is the ability of machines to exhibit human skills such as learning, reasoning, planning and creativity. Artificial intelligence works towards a specific goal, enabling technical systems to perceive their environment and possibly solve problems; it is able to analyse the consequences of previous actions and act autonomously (Parlament Europejski, 2021).

An analysis of the definitions allows us to conclude that artificial intelligence has become increasingly popular and applied more frequently in recent years. The rapid development of electronics and computer science is encouraging the development of this field of science. ‘Intelligent machines’ are needed by humans to create and discover new relationships in the world, so AI is beginning to reach into other areas of science such as medicine, economics or management. Artificial intelligence is one of the more interesting developments in computer science, absorbing a huge amount of human enthusiasm and state-of-the-art computer technology. The scope of artificial intelligence includes algorithms, heuristics, genetic algorithms, expert systems, artificial neural networks and fuzzy logic. The prospect of the emergence of intelligent machines that can think and make decisions on their own is causing anxiety among humans.

2. Literature review and methodology

The literature sources used in the article include mainly domestic as well as foreign literature, surveys and Internet sources were also helpful. These sources made it possible to analyze and show the changes taking place in the recruitment processes using modern technologies. For example, studies such as: “The employee selection process in enterprises - a review of modern and traditional selection methods”, ‘AI an ally of employers, <https://www.forbes.pl/ai-an-ally-of-employers/cjb40f1>’, ‘Selection of employees for organizations against the challenges of the labor market’, or websites such as: <https://sjp.pwn.pl/sjp/sztucznaintelligence;2466532.html>, https://www.sciencedaily.com/terms/artificial_intelligence.htm, On the other hand, we can also find information on the benefits and risks of artificial intelligence for both companies, people and public services in such publications as: “European Parliament (2022)”, ‘Artificial intelligence: development, opportunities and threats’, There are also publications that refer to strategies used in companies, e.g.: “The power of artificial intelligence in recruitment: An Analytical review of current ai-based recruitment strategies”.

The statistical and scientific sources mentioned above allow an objective evaluation of the research problems under discussion and an assessment of the formulated research hypothesis. The main hypothesis states that “The introduction of artificial intelligence in the recruitment management process contributes not only to efficiency and precision in employee selection”.

3. Results

In order to verify the impact of artificial intelligence on the recruitment process of employees, a survey was conducted with 50 HR staff in various companies. The survey was conducted to show whether companies should invest in modern technologies to increase work efficiency and improve recruitment processes. The introduction of automated AI and ATS recruitment systems allows companies to contribute to the automation of processes, analysis of large sets of data, which will lead to an improvement in the quality of recruitment and reduce the time spent searching for potential candidates. In addition, it is also important to remember that the HR department should be properly trained in the use of new technologies and tools, which contributes to the efficiency of recruitment processes. The survey was divided into three thematic areas due to the very similar results of the respondents. Most focused on three aspects that were taken into account because they were crucial in answering the research hypothesis. In the first area, it was decided to investigate whether our respondents were recruited using modern technologies during their recruitment processes and whether they could consider them effective. The results of the following survey are presented in the figure below.

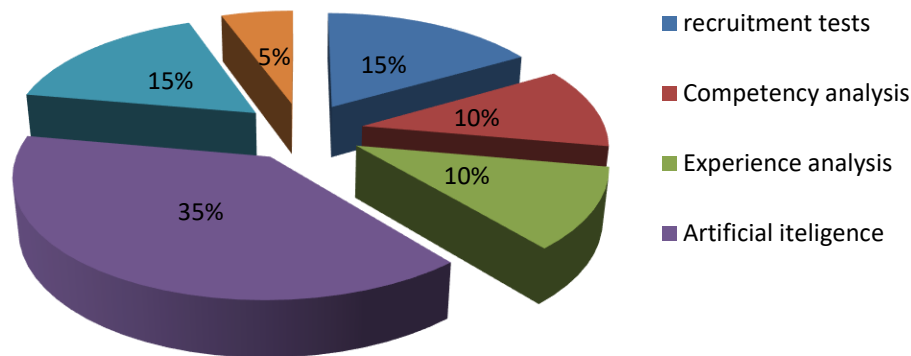


Figure 1. Respondents' opinion on whether they had to deal with a modern recruitment method during the recruitment process and which one they consider the most effective modern one.

Source: own elaboration.

Based on the survey, the most effective method among modern recruitment techniques is artificial intelligence 35%, followed by test recruiting and social media recruitment 15%. With them a little lower our respondents rated experience competence analysis 10%. In last place was outsourcing.

Modern recruitment methods as a model for supporting personnel management is an area that is developing and improving the quality and efficiency of recruitment and selection processes. This is confirmed by the opinions of respondents who are representatives of HR departments of modern companies, who note that these modern recruitment instruments are being used in their places of employment more and more often, and their effectiveness is high Figure 2.

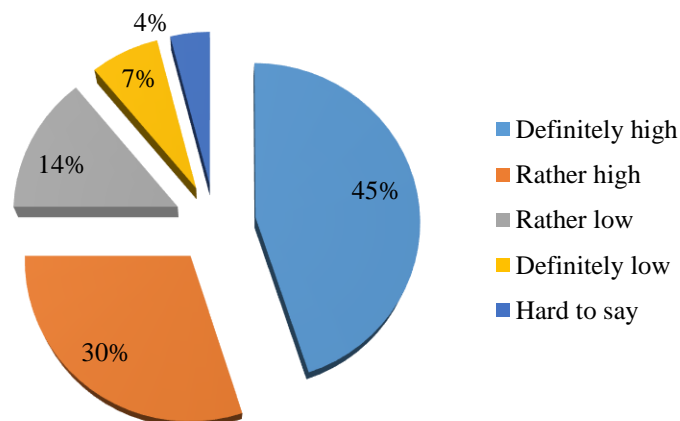


Figure 2. How respondents evaluate the effectiveness of modern methods used in the organization and what are the reasons for their use.

Source: own elaboration.

The above figure shows that knowledge of modern recruitment methods in companies is at a very high level, as evidenced by the result of 45% of our respondents. The answer of rather yes was supported by 30%, which may indicate that they have not yet had an adventure with modern recruitment methods during their recruitment. Third place at 14% was taken by the answer rather low.

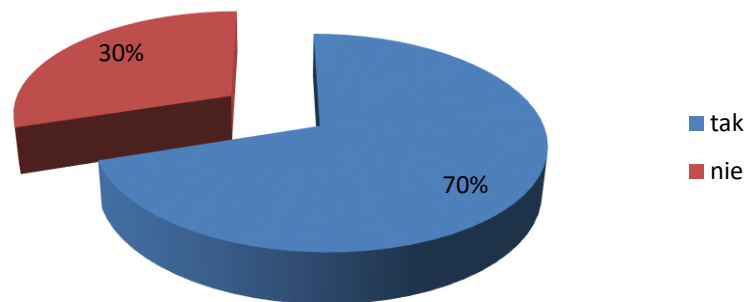


Figure 3. Do they consider the use of artificial intelligence in the retention process to be a good idea and whether they also use or would use modern tools in their companies.

Source: own elaboration.

Summarizing the results of the survey on how modern recruitment methods are used in modern companies, it was found that in most of them:

- recruitment tests, competence and experience analysis are used,
- recruitment outsourcing and recruitment through social media,
- artificial intelligence considered the most effective.

The achieved results of the survey allow us to conclude that the hypothesis was fully confirmed. Modern methods of recruitment and especially artificial intelligence are not only popular and frequently used in modern organizations, but also considered to be very effective. The modern employment market is evolving not only due to economic and technological changes and the related needs of businesses. Modern employee recruitment is increasingly relying on innovative tools that automate processes and allow for more efficient evaluation of candidates. Today, artificial intelligence is becoming an increasingly common tool in many areas of life, including its foray into the employee recruitment process. It plays a key role in automating and streamlining various stages of recruitment, from searching for candidates to assessing their competencies and aptitudes. Artificial intelligence is capable of processing huge data sets (Narvig, 2023). It meticulously and quickly searches extensive databases containing candidate profiles, both on recruitment platforms and online. AI algorithms are able to gather information on candidates' work experience, achievements and skills. AI is able to support the preparation of job descriptions and job offers. It improves the acquisition of labor market data. Artificial intelligence uses machine learning algorithms and natural language processing techniques to search for an application that meets the requirements for a given position, leaving the recruiter to evaluate the most promising candidates (Baranowska, 2021).

Taking this path further, artificial intelligence streamlines processes related to contracts or the creation and signing of documents by generating templates based on established patterns. Artificial intelligence-based systems can analyze existing documents, identify repetitive elements and recommend or create new documents based on these patterns.

Artificial intelligence technologies can be used to identify, classify and index documents based on their content. This allows systems to automatically assign appropriate categories to documents, making them easier to manage and search. Advanced systems using artificial intelligence enable electronic signing of documents (Będkowski, Brdulak, Fazlagić, 2022). Advanced systems using artificial intelligence enable electronic signing of documents. These systems can use complex cryptographic algorithms to ensure the security and authenticity of electronic signatures.

Artificial intelligence, by accessing the calendars of recruiters and candidates, can be used to schedule interviews and manage recruitment timelines. Artificial intelligence helps track contractual deadlines and track the progress of these terms. AI-based systems can generate notifications of upcoming deadlines and provide definitive contract lifecycle management. Some companies, recruitment agencies that are not equipped with recruitment systems or specialize in a variety of fields struggle with the challenge of understanding the specifics of specific positions, which are not always completely familiar to them. In such situations, Chat GPT becomes an invaluable support to generate key information about the requirements and characteristics of a particular position. Once a precisely specified question is asked within seconds, it is subjected to advanced data analysis and a wide range of information to ultimately provide the most important information needed. GPT chat can provide companies and recruitment agencies with relevant information, making it easier to match candidates with specific job needs and requirements (Alto, 2024).

AI can be used to create recruitment Chatbots. Recruiters need to keep in mind that most of the candidates they receive are not adequate and suitable to fill an empty position. Counting this, the use of Chatbots can be the first step in filtering offers. They can be implemented on websites, recruitment platforms, or even messengers such as Messenger, WhatsApp. The most interesting aspect for me is the implementation of chatbots in recruitment itself. It can be done in different ways, depending on the needs and technological possibilities (Alto, 2024).

Current Chatbots are so advanced that they are able to conduct an initial recruitment interview at any time. During such a conversation, the bot asks about work experience, skills, financial expectations and creates a profile of the job applicant based on the answers. The downside of such a form of the first stage of recruitment is that candidates often value personal approach and involvement, and at this point a significant number of candidates are able to detect that they are talking to a bot.

Another example is data analytics and big data. It has arisen as a result of the growing volume of data being generated and processed. These are data sets that are too large, complex, variable, or do not fit into the specific structures of traditional database systems to be effectively managed using traditional data analysis methods. Such huge amounts of data can be used to solve business problems that the company could not solve before.

During the implementation phase, artificial intelligence can personalize training programs to match the specific needs and learning styles of new employees. By analyzing data on employee behavior and preferences, AI systems can create personalized development plans that align with individual strengths and career goals. This tailored approach not only accelerates skill acquisition, but also increases employee engagement and satisfaction.

The role of AI extends to ongoing employee development and performance management. AI tools can monitor employee performance in real time, providing practical information to both employees and managers. This can help identify areas for improvement and development, ensuring that employees receive timely feedback and support. Additionally, AI can help create immersive learning experiences using Virtual Reality (VR) and Augmented Reality (AR), which are particularly effective for roles that require hands-on practice.

Transparency and comprehensibility of AI systems is key to building trust among employees. Employees need to understand how AI-based decisions, such as performance appraisals or promotions, are made. This requires AI systems to be interpretable, allowing users to understand and question decision-making processes. Providing employees with access to training and retraining programs is crucial to mitigating the negative effects of automation. Such initiatives can help employees transition to new roles that require human-centered skills such as creativity, empathy and complex problem solving. What's more, AI's role in performance management and employee supervision can influence workplace dynamics. While artificial intelligence can provide valuable insight into employee productivity and well-being, there is a fine line between monitoring and interference. Organizations must balance the benefits of AI surveillance with respect for employee autonomy and privacy. Clear communication about the scope and purpose of monitoring practices is essential to maintaining a positive work environment.

Artificial intelligence (AI) is a technology that complements and extends human capabilities, partially freeing humans from routine work and allowing them to focus on more meaningful and valuable tasks and solutions. In recent years, AI has become the subject of numerous debates not only among scientists and programmers who work on creating new computer algorithms, but also among other social groups, such as civil servants (seeking to use its solutions in their daily work), doctors (applying AI-based solutions in patient diagnosis) or city residents who encounter AI-based solutions on a daily basis. When discussing the widespread use and application of artificial intelligence, it is also worth mentioning its opportunities and threats, as presented in the table below.

Table 1.
Benefits and risks of using artificial intelligence

Benefits of artificial intelligence	
Type of benefit	Characteristics
For people	<ul style="list-style-type: none"> • improved health care; • safer means of transportation; • cheaper, customized products and services; • easier access to information, training and education; • safer workplaces (robots directed to tasks that are dangerous to humans).
For business	<ul style="list-style-type: none"> • development of a new generation of products and services, including in established sectors in the EU (green and closed-loop economy, healthcare, fashion, tourism, machinery manufacturing, agriculture); • increasing sales; • improving labor productivity, quality and production efficiency; • energy savings; • more efficient customer service, thereby saving time for the customer.
For public services	<ul style="list-style-type: none"> • cost reduction and more efficient management of education, public transportation, waste management, condition of local and regional roads, collection of property taxes, etc.; • - improving product sustainability, reducing greenhouse gas emissions, which would facilitate the achievement of the European Green Deal goals.
Strengthening democracy	<ul style="list-style-type: none"> • providing citizens with access to high-quality data, thereby preventing disinformation and cyber attacks; • applying data-driven controls; • minimizing the possibility of bias in recruitment decisions.
Security and safety	<ul style="list-style-type: none"> • crime prevention and in criminal justice (through faster processing of massive amounts of data, more accurate assessment of the risk of escaping prisoners or countering and preventing crimes and terrorist attacks); • use by online platforms to detect illegal and inappropriate online behavior; • for military purposes for defense and attack strategies in hacking, phishing, cyberwarfare.
Threats and challenges of artificial intelligence	
Underutilization of artificial intelligence systems	For the EU, insufficient use of artificial intelligence could represent poor implementation of important programs, such as the European Green Deal, loss of competitive advantage in selected economic areas, or worse living conditions for citizens.
Abuse of artificial intelligence systems	Investing in artificial intelligence solutions that will prove useless in the future.
Liability for damage caused	It is important to determine who is responsible for the damage caused by an AI-based device or service: the manufacturer, the owner or perhaps the developer? Too little liability on the part of the manufacturer will not motivate it to offer good quality AI-based goods and services, and too much liability will have the effect of limiting innovation in this area.
Threats to fundamental rights and democracy	<ul style="list-style-type: none"> • The results generated by artificial intelligence depend on the algorithms used and the quality of the data (risk of biased data). • Artificial intelligence can have a significant impact on privacy rights and data protection (e.g., facial recognition, online tracking and profiling of individuals). • Artificial intelligence contributes to the creation of information bubbles in social media, as well as the spread of fake videos, recordings and information through the so-called deepfake technique. • Threat to freedom of assembly and protest - using AI, it is possible to track and profile people with certain beliefs.
Impact on jobs	Risk of eliminating a large number of jobs (either through automation or major transformation) - according to the EP Think Tank's 2020 estimates. 14% of jobs in OECD countries can be highly automated.

Source: own elaboration based on: Parlament Europejski 2022.

Speaking of the benefits and risks of using AI, it is impossible not to also mention the challenges that come with its use now and in the future. Although AI is capable of solving many problems that humans would not be able to handle, we still know little about how it will affect our lives, the way we make decisions or build relationships. Even experts cannot confirm that they fully understand the operation of AI systems (the so-called black box). AI systems are currently limited to relatively narrow and well-defined tasks, and the reason for the bias of the algorithms is the human bias contained in the data. From this perspective, it is important to be aware of the shortcomings of AI systems, and in the future work on proven ways of evaluating algorithms, building transparent and reliable systems, and good human-AI relations (Craglia, 2018).

4. Discussion and conclusions

Recruitment is a way to attract new employees. For many years, all activities were carried out through traditional means i.e. sending resumes, cover letters or holding a recruitment interview at the company's headquarters. The development of technology has contributed to the creation of IT tools to support the recruitment process. Thanks to them, it was possible to analyze a large amount of information in a relatively short period of time and select people who most closely meet the expectations set by the employer. Recruitment is a way to attract new employees. For many years, all activities were carried out through traditional means i.e. sending resumes, cover letters or holding a recruitment interview at the company's headquarters. The development of technology has contributed to the creation of IT tools to support the recruitment process. Thanks to them, it was possible to analyze a large amount of information in a relatively short period of time and select people who most closely meet the expectations set by the employer.

The analysis carried out proves that the hypothesis set forth has been fully confirmed. Recent years and especially the pandemic period have caused changes in recruitment processes and accelerated many trends that have been developing in the HR field. It has resulted in more frequent use of modern methods of candidate selection, based, among other things, on the use of technology, artificial intelligence and automation of recruitment processes.

The widespread use and comprehensive impact of AI in the labor market has translated greatly into the field of human resource management. HR departments are already using AI to streamline HR processes, decision-making processes and improve the overall employee experience. Some of the key areas of AI's impact in human capital management that will almost certainly grow in importance include:

1. AI-based recruitment tools that are used to automate and optimize the recruitment process. These tools use algorithms to review resumes, conduct online assessments and match candidates. This saves HR professionals time and effort in identifying candidates, while reducing biases and improving the accuracy of hiring decisions.
2. AI can help evaluate performance by analyzing employee performance data, such as tasks completed, deadlines met, and feedback from co-workers and managers. This can help HR professionals provide more objective, data-driven feedback to employees and identify areas for improvement.
3. AI-based tools can monitor employee well-being by analyzing data on factors such as working hours, stress levels and sleep patterns. The data can help HR professionals reduce signs of burnout or other well-being issues and take proactive measures to support employees.
4. With AI, we can analyze large amounts of HR data to identify patterns, trends and insights that can help inform strategic decisions.

The considerations made allow us to conclude that in today's dynamic business environment, finding and retaining the right employees has become a key challenge for organisations. Recruitment and selection processes play a crucial role in building effective teams that can effectively support corporate goals and strategies. In this context, the development of modern recruitment and selection methods is of paramount importance for organisational success. With today's challenges facing businesses, competition for talent is becoming increasingly fierce. Companies are competing not only for customers and markets, but also for outstanding employees who are key ingredients for organisational success. In view of this, employee recruitment and selection processes are becoming strategically important for maintaining competitiveness and achieving business goals.

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