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Features of Using Innovative Technologies in Recruitment Through Artificial Intelligence Tools

Abstract

The article is devoted to the relevant issue – the study of the peculiarities of applying such innovative technologies as artificial intelligence (AI) in the recruitment of personnel in modern companies, with the aim of optimizing recruitment costs and reducing the influence of the human factor in decision-making. It has been proven that the implementation of innovative technologies in personnel work is essential for adapting to modern market conditions, increasing efficiency, and improving interaction between employers and employees. Such modern technologies as artificial intelligence, social networks, automation of HR processes, remote work platforms, analytical systems, etc., significantly change the traditional approaches to human resource management, opening up new horizons for company development. Innovative systems make it possible to ensure the rapid analysis and assessment of candidates during hiring (recruitment), optimize personnel activities, minimize risks, and make effective HR decisions. In addition, the automation of personnel management processes allows for a quick response to external and internal environmental factors of the enterprise's activities, enabling the company to promptly adapt to new labor market requirements. One of the main aspects of applying innovative technologies in HR is increasing the efficiency of recruitment and personnel management processes. Thanks to the use of AI, machine learning, and other technologies, automated systems enable a more accurate and objective candidate selection process. The analysis of this data set makes it possible to identify patterns in employee behavior, helps to predict potential problems, and allows timely influence on staff motivation and the overall efficiency of the company's operations. The *purpose* of the paper is to highlight modern artificial intelligence tools that can be used to improve the efficiency of recruitment processes. *Methodology.* The implementation of innovative technologies is essential for adapting to modern market conditions, increasing efficiency, and improving interaction between employers and employees. Modern technologies such as AI, social networks, HR process automation, remote work platforms, analytical systems, and others are significantly transforming traditional approaches to human resource management, opening new horizons for company development. Attention has been drawn to innovative recruitment technologies in the hiring process, and their effectiveness has been demonstrated. Based on the *results* of research of existing trends in the recruitment services market, the advantages and disadvantages of artificial intelligence (AI) in recruitment were analyzed, and practical examples were provided. Attention is drawn to the fact that the application of AI simplifies and accelerates personnel selection processes, employee performance evaluation, and other aspects of human resource management, making them even more precise and objective. The research has shown that AI serves as an assistant, not a replacement for a specialist, and currently it cannot be compared to human intelligence, as it only helps to more quickly automate and optimize recruitment and HR management processes. *Practical implications*. Under modern conditions, one of the key factors for the successful functioning of companies and a tool for enhancing their competitiveness is the proper selection of employees who must

Keywords

recruiting, innovative technologies, artificial intelligence, human resources, personnel management, intelligent solutions

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possess the necessary level of qualifications, skills, and competencies. The organization of labor in any company has certain features determined by the specifics of its operations. It should be noted that the use of new approaches based on modern innovative technologies and the latest personnel consulting tools significantly increases the efficiency of the personnel selection process. *Value / originality*. In scientific discourse, recruitment is recognized as one of the technologies for successfully implementing personnel policy, allowing for job evaluation, creation of a competency profile, identification of optimal recruitment channels, evaluation of candidates, and their support during the adaptation period using both comprehensive and individual approaches, thereby contributing to the effective formation of the enterprise's human resources potential with the required level of professional knowledge and skills. However, it should be noted that in most cases, research on innovative technologies in recruitment is developing rapidly, with new tools and opportunities constantly emerging, requiring new challenges and further investigation.

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1 Introduction

Artificial intelligence has transformed the world. With its ability to streamline processes, analyze company-wide data, and uncover insights that may be inaccessible to recruiters, AI is revolutionizing the way organizations find, attract, and hire top candidates.

35% of global companies are already using AI in business. More than 50% of companies plan to implement artificial intelligence technologies by 2025. This means that over 77% of organizations are either using or exploring the potential of AI. By 2030, the global artificial intelligence market is expected to reach $1.85 trillion (Campion, 2023).

Moreover, AI technologies are increasingly being integrated into various fields, including recruitment.

Recruitment is capable of combining into a single system the activities of "searching for, studying, selecting, evaluating, and creating a pool of candidates with the aim of realizing their abilities and potential to achieve the company's goals" (Aguinis, Beltran, Cope, 2024).

It is widely recognized that AI can have a positive impact on the hiring process by automating various recruitment tasks. Potential outcomes of such an impact include saving HR staff time, reducing workload, and increasing accuracy in identifying the best candidate while reducing bias and ensuring alignment with company values. AI-based innovative technologies can be implemented throughout the entire employee lifecycle within a company, from recruitment to career development.

The relevance of using AI is illustrated by numerous studies. For example, 73% of managers and employees claim that AI can improve the company's overall performance and help minimize employees' routine work (Campion, 2023).

2 The Impact of AI-Based Technologies on Recruiting

Recruitment using AI-based technologies involves the search and collection of data through an intelligent analysis system utilizing the decision tree method (Rathore, 2023), which is often employed for predictive selection among a large number of applicants' resumes.

Such search systems also work with social or professional networks (e.g., LinkedIn), gathering textual information and classifying it according to positive or negative content sentiment. In the recruiter's work, platforms such as Indeed, JobBuilder, Monster, and others are used with intelligent search systems for matching vacancies and applicants based on predefined qualification requirements. Next, chatbots are utilized – intelligent solutions that automate labor-intensive tasks such as screening and evaluation by using neural language processing to interact with candidates through voice and text methods.

The chatbot initiates real-time communication, conducts assessment tests, and answers applicants' questions. Examples of modern chatbots include Mya, HireVue, and Wendy. For instance, Mya provides candidates with feedback, analyzes their profiles, and asks context-specific job-related questions. In ambiguous cases, the system can self-learn through interaction with humans. The service can rank both candidates and interview results.

Recently, over 1.2 million mentions of AI chatbots have been recorded, which is a 440% increase compared to last year (Rakesh, Bhau, 2024).

HR chatbots help reduce the burden of administrative tasks, freeing up potential to focus on initiatives that increase company value. HR chatbots are programs that use artificial intelligence (AI) to perform various functions in human resource management, such as answering basic questions, completing tasks, and providing support.

According to Precision Reports, the HR chatbot market is expected to experience significant growth between 2023 and 2030. The United States is projected to play a key role in the development of HR chatbots. A high level of adoption of this technology and the presence of major industry players will create ample opportunities for market growth.

Intelligent solutions such as Affectiva, HireIQ, and HireVue are aimed at evaluating candidates

during interviews by analyzing voice, honesty, word choice, tone, and speaking style (emotional intelligence).

Another AI solution is Replika, a personal artificial assistant that communicates in real time with expressions of empathy.

3 Comparison of Traditional and Innovative Recruiting

The introduction of AI in recruiting has a number of advantages, which, compared with traditional ones, can be summarized in Table 1.

The results of the comparative analysis of traditional and innovative recruitment confirm the significant advantages of implementing artificial intelligence tools in personnel selection processes. The use of AI enhances the speed and efficiency of hiring, automates routine tasks, reduces recruitment costs, increases the objectivity of candidate selection, and enables the processing of large volumes of data. Furthermore, AI technologies facilitate a more accurate assessment of candidates' emotional and behavioral characteristics and allow for the prediction of their effectiveness, which overall improves the quality of the recruitment process and aligns with the current demands of digital transformation in human resource management.

4 Key Benefits of AI in Recruiting

The main advantages of artificial intelligence in personnel recruitment can be identified as follows:

1. Objectivity and impartiality in candidate evaluation. AI algorithms assess resumes, tests, interviews, and motivation letters based on predefined objective criteria, reducing the influence of recruiters' personal biases, sympathies, or antipathies. This contributes to creating a more diverse and inclusive workforce.

Example: The Pymetrics platform uses neuropsychological games to evaluate competencies without subjective bias.

2. Increased efficiency and speed of recruitment. AI can process and analyze large volumes of resumes and applications in a short period of time. This significantly accelerates the hiring process, especially for mass recruitment. Automation of the initial candidate screening (sorting, preliminary evaluation) relieves recruiters from routine tasks, reducing time at each stage.

Example: The multinational company Unilever reduced its hiring time from 4 months to 4 weeks by implementing the HireVue AI platform for video interview and game-based assessment analysis.

3. Accuracy, scalability, and adaptability of solutions. AI is capable of processing vast amounts of data and identifying patterns inaccessible to humans. AI systems can also be easily adapted to the specifics and needs of companies of any size, enabling the scaling of recruitment processes across branches in different regions.

They are successfully integrated with other HR systems; for instance, SAP SuccessFactors and Oracle HCM Cloud offer scalable solutions for global companies.

4. Automation of multi-step processes. AI can not only analyze resumes but also conduct video interviews, recognize emotions, verify data accuracy, and generate reports.

Example: HireVue is used by Vodafone, Hilton, and Deloitte for video interviews with speech, facial expression, and gesture analysis.

5. Cost reduction. Automation reduces recruitment costs compared to traditional methods, as AI optimizes the recruitment budget by reducing the need for external agencies, minimizing HR specialists' working hours, and decreasing the number of unnecessary interviews. Just two years ago, the chatbot market was valued at $2.6 billion. By 2025, it is expected to quadruple.

TABLE 1 Comparison of traditional and innovative recruiting

Criterion	Traditional Recruitment	Innovative AI-based Recruitment
Candidate search, resume processing	Manually, time-consuming	Automatic scanning of large volumes of resumes within seconds
Selection objectivity	Possible bias, subjective influence	Selection based on criteria without emotional bias
Hiring speed	From several days to several weeks	From a few minutes to 1–3 days
Candidate communication	Phone calls, email, manual interview scheduling	Chatbots, automated scheduling, instant responses
Process cost	High due to time costs and possible errors	Lower due to automation
Emotional and behavioral analysis	Only during in-person interviews, depends on HR experience	Automated video analysis of facial expressions, gestures, intonation
Cultural fit assessment	Intuitive, based on subjective impression	Use of cultural fit models
Mass recruitment	Requires a large team of recruiters	One HR specialist + AI tool can process thousands of candidates
Candidate effectiveness prediction	Rarely conducted, requires additional resources	AI predicts adaptation, success, and productivity

In Ukraine, the recruitment platform Djinni uses chatbots to interact with IT professionals. L'Oréal implemented the Mya chatbot, which communicates with candidates, tracks the process, and informs them about hiring stages.

6. Enhanced analytical capabilities. AI provides data collection and analysis of candidates and recruitment processes, enabling HR departments to build reports, identify trends, and optimize hiring strategies. *Example:* LinkedIn Talent Insights offers companies labor market analytics and employer brand competitiveness insights.

7. Improved hiring quality and candidate success prediction. AI analyzes not only resumes but also test results and behavioral data, predicting the candidate's successful integration into the team.

For example, in the context of personnel management and recruitment, the globally renowned Dutch company ASML uses modern HRIS platforms (SAP SuccessFactors), recruitment process automation, and digital career portals. IBM Watson Recruitment is used by international companies to assess candidate competency alignment with job requirements based on big data analysis.

8. Reduced risk of errors. Artificial intelligence is more objective and consistent in decision-making.

9. Availability. AI operates 24/7, providing support at any time.

10. Increased inclusiveness and adherence to DEI principles. AI helps eliminate discriminatory filters, ensuring equal access to vacancies for all candidates, which is especially relevant in wartime due to the increasing number of people with disabilities.

It is known, for example, that ASML successfully employs individuals with autism spectrum disorders.

5 Disadvantages of AI Tools in Recruiting

Let us consider the disadvantages inherent in the use of artificial intelligence tools in recruitment:

1. Integration complexity. Many organizations or HR professionals find it difficult to integrate AI into existing recruitment processes. Some models and software require licensing and specialized skills, leading to additional costs.

For example, a psychometrician may need to acquire new skills to work effectively with AI. One such skill is prompt engineering – the ability to formulate effective prompts.

2. Algorithmic bias. Certain AI algorithms, such as neural networks, may be opaque and difficult to understand in terms of their decision-making process. AI can replicate or even amplify biases embedded in the training data. Therefore, algorithms have limited ability to comprehend complex contexts, nuances, and subjective factors.

Example: In 2018, Amazon (USA) discontinued an AI recruitment tool because it undervalued women's resumes for technical positions. The algorithm had been trained on a dataset spanning 10 years, predominantly featuring male applicants, resulting in gender discrimination (Aguinis, Beltran, Cope, 2024).

3. Reduced human interaction. Excessive automation in recruitment leads to decreased personal contact between employers and candidates, negatively affecting employer brand perception and candidate experience. AI lacks the ability to account for human characteristics that may play a significant role. It makes simple automated decisions without human emotional intelligence, which has limitations. There is a risk of missing important details not explicitly reflected in resumes.

Example: Unilever (UK) implemented video games and AI-based video analysis to assess internship candidates. Studies showed that some candidates experienced stress and discomfort from automated processes without interaction with live recruiters.

4. Disinformation and errors. AI does not completely eliminate the risk of errors or the delivery of inaccurate or unfounded information.

For example, AI might misinterpret psychometric assessment results, requiring additional verification by a specialist.

5. Legal and ethical constraints, including data processing concerns. Implementing AI in personnel evaluation requires processing large volumes of data, often including personal data. The use of AI in recruitment is often not fully regulated by local laws, creating legal risks in disputes, such as accusations of discrimination.

Example: Meta (USA) and LinkedIn (USA) faced lawsuits over opaque job advertisement algorithms that "nudged" specific demographic groups, thereby limiting opportunities for others.

6. Privacy concerns. AI usage often entails collecting and processing large amounts of personal data (e.g., video, audio, text), raising compliance questions with GDPR and local regulations. The EU's General Data Protection Regulation (GDPR) requires companies operating in the EU (e.g., SAP, Siemens, Bosch) to revise AI processes to ensure candidates' rights to explanation of automated decisions and the right to data correction.

7. Employee distrust. Since widespread implementation is relatively recent, employees may be skeptical about AI use. Research indicates that introducing AI without trust negatively affects psychological well-being and productivity. This applies not only to evaluation specialists but also to employees being assessed by AI-based methods, raising transparency issues – particularly the problem of the "black box."

8. Lack of transparency or the "black box" effect. This refers to models whose decision-making processes are hidden from the user and cannot be fully explained. Both employers and candidates

may not understand why the system selected or rejected a particular candidate.

This is often associated with complex neural networks involving millions of parameters trained on massive datasets. A key issue with such models is their low interpretability. Even developers cannot always explain specific decisions, creating significant risks.

Example: HireVue (USA), a video interview platform analyzing facial expressions and voice, was criticized by the American Bar Association for its lack of decision explainability. In 2021, HireVue discontinued video analysis, retaining only text analytics.

9. High implementation and maintenance costs. Implementing AI solutions requires significant investments in technological infrastructure, staff training, and business process adaptation.

Example: Nestlé (Switzerland), despite positive outcomes from AI recruitment pilot projects, faced ongoing costs due to the need to adapt the system for new countries and languages.

10. Limited applicability for small and medium-sized enterprises (SMEs). Most AI solutions are developed for large businesses and may be unprofitable or overly complex for SMEs.

Example: Local IT companies in Kharkiv and Lviv (Ukraine) often use classic Applicant Tracking Systems (ATS) without AI, as implementing AI recruitment requires additional funding and data processing expertise.

6 Conclusions

Based on the conducted research, it can be asserted that the implementation of innovative tools such as artificial intelligence (AI) in human resource management in general, and in recruitment processes in particular, is not only relevant but also a strategically necessary step for modern companies seeking to enhance their competitiveness in the conditions of a dynamic labor market.

AI-based tools – such as automated resume screening systems, chatbots, video interview analysis platforms, candidate fit prediction algorithms, and emotional intelligence assessment systems – enable significant reductions in the time and resources spent on talent search and selection. They also improve the objectivity and accuracy of decisions and optimize management processes.

Innovations in recruitment free up part of the routine work related to processing candidate applications. However, in the foreseeable future, they cannot fully replace human interaction during final interviews. Only an experienced recruiter can evaluate a candidate by applying psychological techniques, intuition, and a sense of tact.

Practical cases of using such technologies in leading global companies, including Amazon, Unilever, Siemens, Nestlé, and SAP, demonstrate their effectiveness and capacity to transform traditional approaches to human resource management. At the same time, the implementation of AI-based tools is accompanied by a number of challenges – risks of algorithmic bias, insufficient transparency in decision-making, data protection issues, as well as ethical and legal considerations, which require clear regulations, proper governance, and continuous monitoring of effectiveness.

Thus, the use of innovative AI-based management tools in recruitment serves as a powerful lever for increasing HR productivity, optimizing costs, and strengthening organizational human capital. However, the effectiveness of their implementation directly depends on the level of digital literacy among HR professionals, adaptation of business processes, and compliance with ethical and confidentiality standards. Future research in this area should focus on developing mechanisms to overcome these limitations and on integrating AI into strategic human resource management.

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