

# The role of artificial intelligence in personnel selection and performance management

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## Abstract

The article discusses the role of artificial intelligence (AI) in personnel selection and performance management. It is noted that AI significantly simplifies and accelerates the candidate selection process by automating resume analysis, conducting tests, and interviews. Additionally, the use of AI in personnel performance management is discussed through monitoring and analyzing work processes, identifying problem situations, and proposing optimal solutions. The advantages and challenges associated with the implementation of AI in personnel management are explored, and ways to overcome them are proposed.

## Keywords

Artificial intelligence, efficiency, personnel efficiency

## 1. Introduction

In the modern world, the rapid development of technology, particularly artificial intelligence (AI), is transforming traditional approaches to personnel management. AI plays a key role in implementing innovative practices for recruitment and personnel performance management. Its power in streamlining processes, analyzing large volumes of data, and making informed decisions makes it an integral component of human resource management.

Artificial intelligence (AI) is a field of computer science specializing in creating systems capable of performing tasks that require intellectual abilities similar to humans. Major components of AI include machine learning, natural language processing (NLP), computer vision, and other technologies that model human thinking and behavior. In today's world, AI is becoming increasingly popular and has a significant impact on various aspects of life. It is applied in autonomous vehicles, voice assistants, the Internet of Things, medicine, finance, marketing, science, and other fields [1].

AI, based on progressive learning algorithms, represents the ability of machines and programs to analyze information, draw conclusions, and make decisions based on them. Particularly relevant in the modern world is the fact that AI capabilities are successfully tested and used in the medical field. For example, artificial intelligence has found wide application in detecting and classifying cardiac arrhythmias based on electrocardiograms, as well as in diagnosing and treating eye diseases in ophthalmology. Moreover, AI-based technologies allow synthesizing human language by analyzing the neural activity of the auditory cortex of the brain and other aspects.

In this article, we will thoroughly explore the impact of artificial intelligence on modern personnel recruitment and performance management in organizations. We will analyze various aspects of this issue, from the increasing use of automated tools for candidate selection to the implementation of intelligent systems for monitoring and analyzing work processes.

However, along with the power of AI, challenges arise. Questions of ethics, transparency, and personal data protection become particularly relevant in the context of its use in personnel

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management. Moreover, the risks of algorithmic bias may lead to incorrect or unreliable decisions, threatening the objectivity of management processes.

## 2. Main Part

In today's world, where competition in the market is extremely high, the issue of proper recruitment, training, and personnel adaptation becomes crucial for the success of any company. These processes are not just important - they are decisive in shaping an efficient and productive work environment. Carefully selected and trained personnel reflect the cultural values and strategic goals of the company, helping it achieve its objectives.

Each employee is not just a workforce but a key member of the team who will contribute to achieving common goals. Therefore, it is important to understand that each new employee is a potential opportunity for the company, but also a possible risk if the selection process is not carried out properly.

Training and development of personnel are ongoing processes that require constant improvement and enhancement of skills and competencies. This allows employees not only to maintain their relevance in the modern market environment but also to develop their potential, contributing to the overall success of the company.

Personnel adaptation is a process that requires consideration of the individual characteristics and needs of each employee. Understanding and careful consideration of their needs and expectations can positively impact their motivation and productivity, ensuring a harmonious and effective work atmosphere.

A well-established process of recruitment, adaptation, and personnel training brings several advantages to a company:

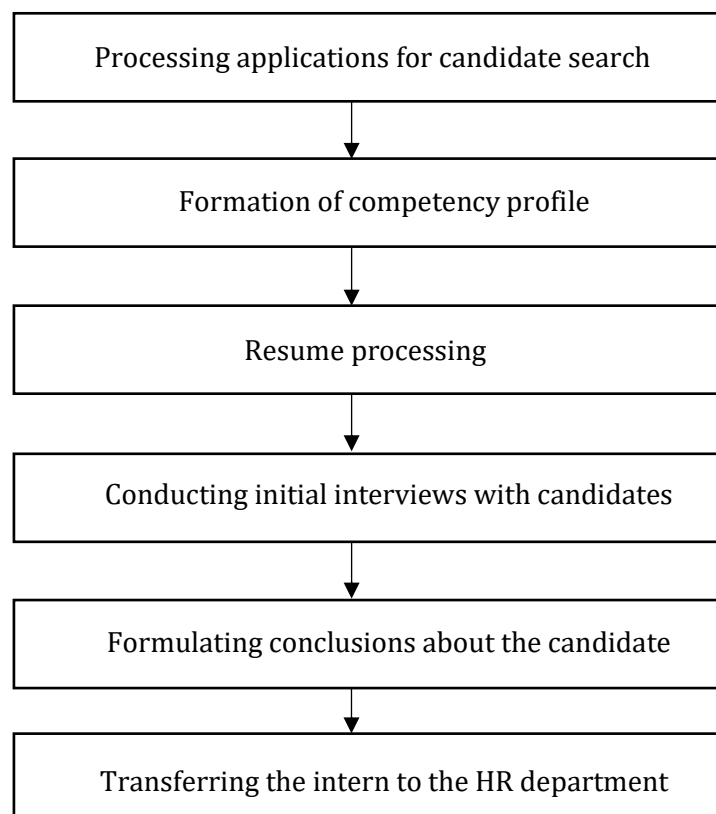
- Proper candidate selection is a key factor in a company's success. Choosing the most suitable candidates ensures a proper level of competence, motivation, and cultural fit, which contributes to the effectiveness and success of the team.
- The more aligned personnel are with the specific job requirements and corporate culture, the more likely they are to work efficiently and productively. Training and adaptation to work processes and company requirements help foster this productivity.
- Investing in personnel training and development contributes to talent retention and development within the company. This not only increases employee motivation and engagement but also helps the company build a strong team for the future.
- Proper training and adaptation can help reduce the company's costs on recruiting and replacing employees. Ongoing training can also ensure that employees have the necessary skills and competencies to effectively perform their jobs, reducing errors and improving product or service quality.
- Companies that effectively work with their personnel have a significant competitive advantage. The skills and competencies of personnel can become key success factors in today's dynamic business environment.

Continuous improvement of personnel management is a key element of successful operation for any company. It allows enhancing the efficiency and productivity of the team, increasing employee satisfaction, and reducing turnover. The paths to achieve this goal include improving recruitment and training processes, creating motivational programs, and ensuring adaptation to changes in the internal and external environment of the company. Investing in employee development is an important strategic initiative that contributes to enhancing competitiveness and stability of the enterprise in the long term.

All processes related to personnel in the company can be divided into 2 components: recruiting and HR (Human Resources). The recruiting department in the company is responsible for the personnel selection process, which includes the following (see Fig. 1):

- Application processing - this involves registering applications from department managers to open a vacancy.

- Competency profile formation - after receiving the application, the recruiter, together with the department manager, forms a competency profile that potential employees should meet.
- Recruiters analyze candidates' resumes, considering their work experience, education, and other important skills for potential compliance with the defined competency profile.
- After processing the resumes, recruiters contact potential candidates and conduct initial interviews with them. The purpose of such interviews is to assess the candidate's skills and basic abilities for compliance with the vacancy.
- Based on the conducted interviews, the recruiting department draws conclusions about the best candidates, transfers them to the department manager, and assists in organizing the next interview stages.
- In case of successful interviews, the recruiting department transfers the candidate to the status of "intern" and forwards them to the HR department."



**Figure 1:** Recruitment Department Workflow Process

After the transfer of the intern to the HR department, HR managers continue to work with them, with the task of ensuring their proper integration and adaptation within the company. The HR department in the company performs the following functions:

- The HR department ensures the onboarding of new employees, which includes organizing and coordinating orientation programs for new hires (introduction to corporate culture, understanding the role and responsibilities of the employee in the workplace).
- The HR department is responsible for organizing and conducting various training events for interns to effectively integrate them into the company and ensure high work productivity.
- The HR department develops and implements training and development systems for existing employees by analyzing their qualification levels with the aim of improvement.
- The HR department is responsible for developing and implementing motivation systems for employees to stimulate them to work more effectively.
- The HR department conducts analysis of the performance of existing employees to assess their productivity levels and identify possible areas for improvement to ensure that employees work more effectively.

- The HR department in the company conducts 1-2-1 and 360 assessments to gather and analyze feedback on the professional development of employees. 1-2-1 assessments are conducted directly between the manager and the employee for an objective assessment of the employee and areas for their further development. 360 assessment involves feedback from colleagues, managers, and subordinates.

- The HR department organizes and conducts events aimed at strengthening teamwork and maintaining a positive work environment.

HR is an integral component of modern organizations, playing a crucial role in ensuring the success and effectiveness of the company. Its functions include personnel management, talent development and retention, employee training and development, work analysis, and staff motivation. By implementing effective human capital management strategies, the HR department provides the company with a competitive advantage in the market, contributing to its stable development and achievement of strategic goals.

In the field of human resources management (HR), there is an optimistic concept of improving efficiency and fairness through the application of artificial intelligence (AI). This is reflected in the trend of improving HR technology methods. Highlighting AI as an innovative element, it should be noted for its potential in performing cognitive tasks such as scalability, accuracy, and efficiency. For instance, it can be applied in candidate selection for vacant positions. Staff recruitment is another area where AI can be applied, particularly in streamlining candidate search and selection processes, as well as in determining appropriate profiles according to selection criteria. The use of various AI tools will allow for more effective prediction of the success of future candidates in the company. Among the typical use cases, AI is used to address double complexity problems that may arise in enterprises during the selection of candidates with similar characteristics, as well as to make economically justified decisions regarding the choice of candidates among existing applicants for a vacant position [2].

Let's consider examples of AI-based software programs for recruiting and HR. Lever is an integrated platform that provides tools for managing vacancies, processing applications, conducting interviews, and analyzing data on recruiting and staff productivity. The use of artificial intelligence algorithms helps automate selection processes, analyze resumes, and match candidates to vacancies based on defined criteria. Such software contributes to improving the efficiency of recruiting processes and ensures more objective and transparent human resources management [3].

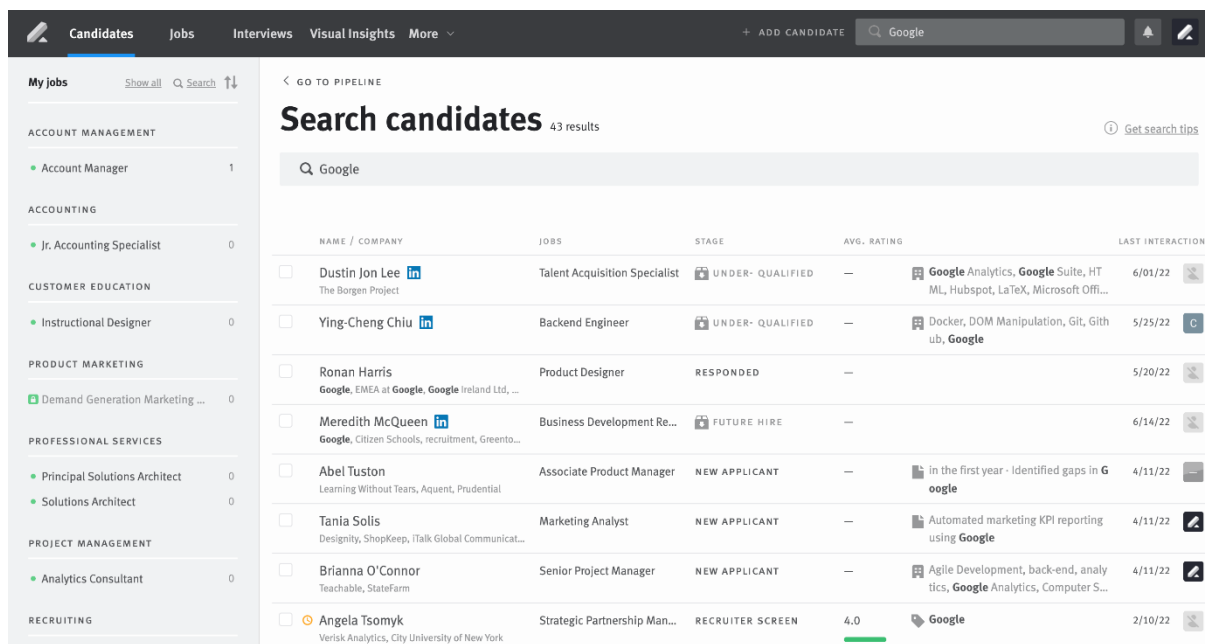


Figure 2: Recruitment Process Management Window in Lever

Advantages of the Lever software tool:

- Lever offers a wide range of tools for managing job vacancies, processing applications, conducting interviews, analyzing data, and reporting, saving time and effort required to use multiple different software tools.
- Lever utilizes artificial intelligence to automate many aspects of recruitment, such as application processing, resume analysis, and candidate selection, reducing human errors and increasing process efficiency.
- Lever facilitates collaboration among recruitment team members, allowing them to easily communicate, share feedback, and work together on candidates.
- The platform provides advanced analytics and reporting tools, enabling recruiters and HR managers to analyze the effectiveness of their work and make informed decisions.

Disadvantages of the Lever software tool:

- Utilizing the Lever platform can be costly, especially for small companies or startups with limited recruiting budgets.
- Some users note that Lever may have a certain learning curve due to the complexity of the interface and the time required to master all the platform's functionalities.
- For some users, the customization options of the software may be limited to specific company needs, which may necessitate the use of additional solutions or the adaptation of business processes to fit the platform's capabilities.

Humu is a software that utilizes artificial intelligence to manage human resources and improve the work environment within companies. One of the key advantages of Humu is its ability to adapt to individual employee needs by offering personalized training programs and tasks to enhance efficiency. The platform also employs analytics to study the emotional state and engagement of employees, enabling leadership to respond to issues and suggest improvements. Humu also provides tools for monitoring and analyzing employee performance and generating reports, aiding management in making informed decisions regarding personnel management. Although Humu may have some limitations in flexibility and may pose challenges in terms of learning curve for some users, it serves as a powerful tool for implementing innovative approaches to human resource management in modern organizations [4]

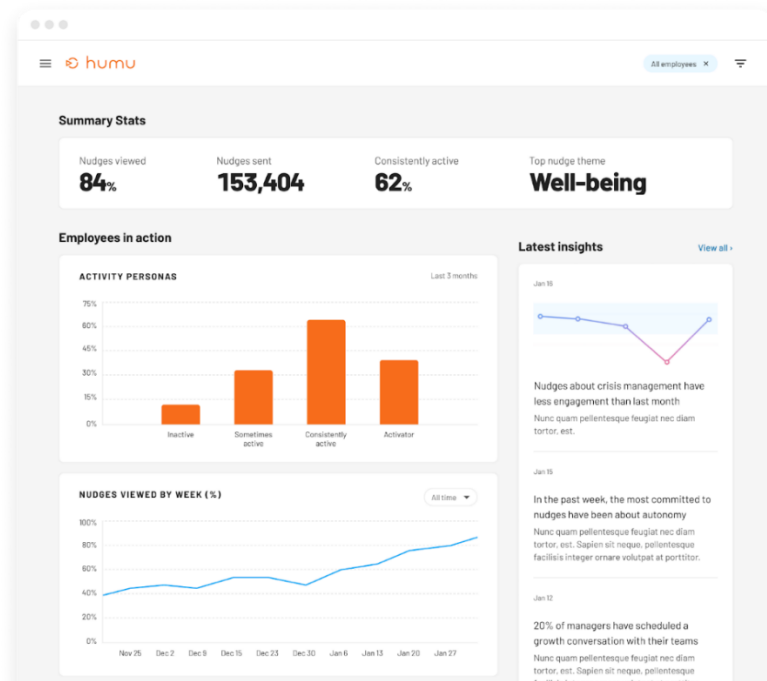


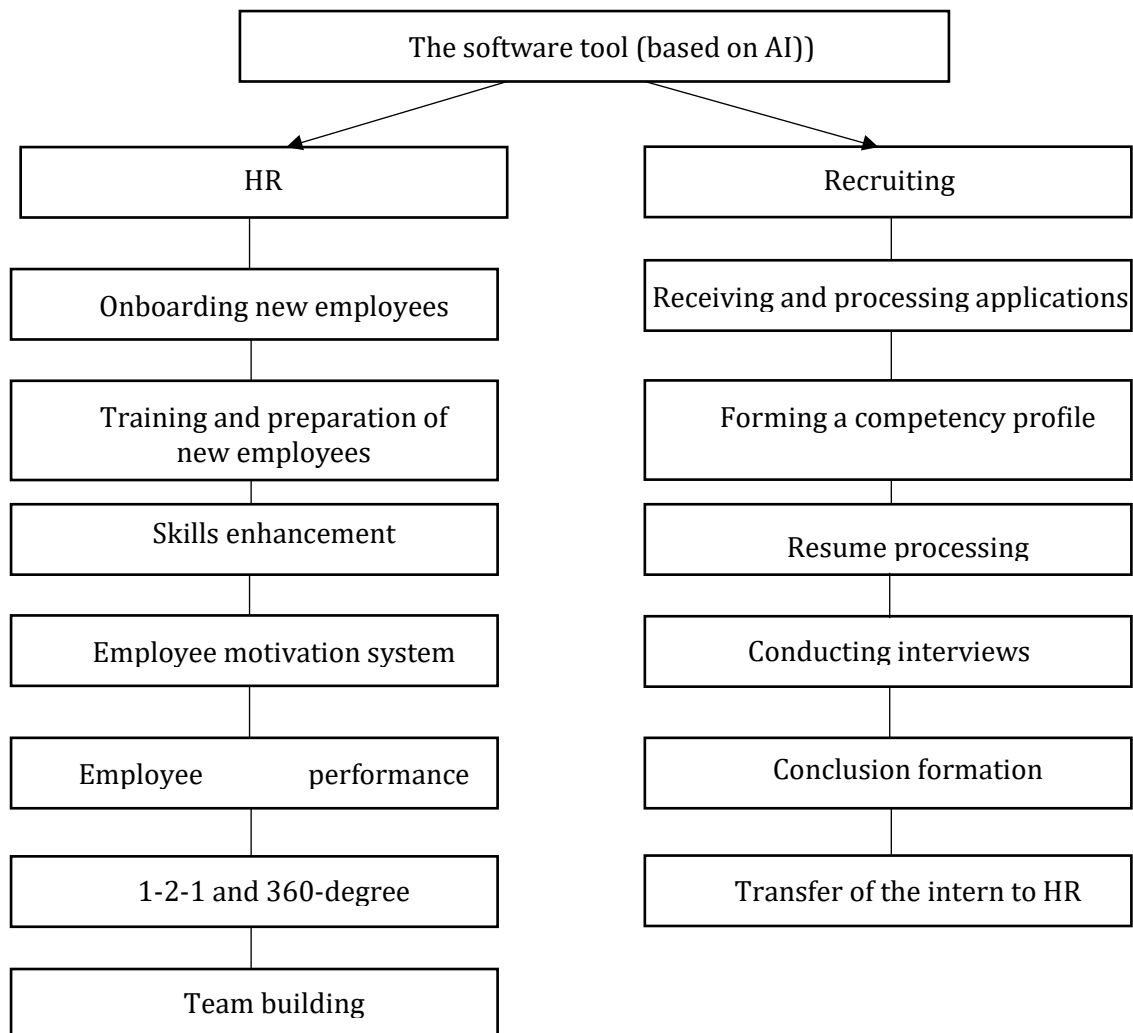
Figure 3: Humu Software Interface Window

Advantages of the Humu software:

- Humu utilizes artificial intelligence algorithms to create personalized training programs, allowing for the adaptation of learning materials to the needs of each employee.
- The platform employs analytics to study the emotional state and engagement of employees, enabling the identification of issues and suggesting appropriate measures for improvement.
- Humu provides tools for monitoring and analyzing employee productivity, allowing management to obtain objective information about the performance of their team.

Disadvantages of the Humu software:

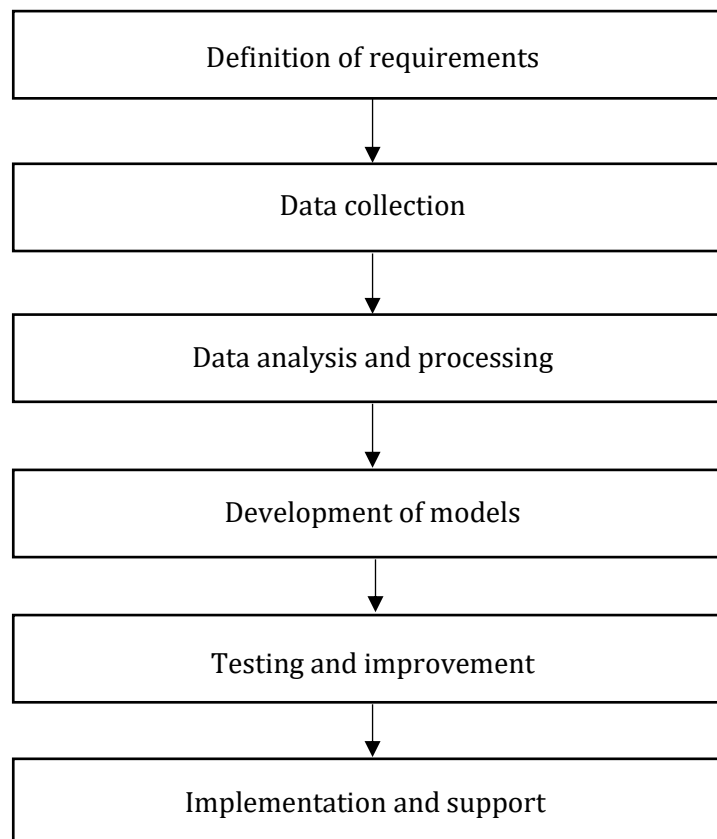
- Some users may find limited customization options to tailor the software to the specific needs of their company.
- The interface and functionalities of Humu may require some time to learn, which can be challenging for some users.
- Utilizing the Humu software may be costly, especially for small companies with limited budgets.



**Figure 4:** Concept of AI-based recruiting and HR software

Considerations for Using Artificial Intelligence in Recruitment and HR Processes. The general concept of software utilizing artificial intelligence to enhance the efficiency of recruitment and HR processes is depicted in Figure 4:

- AI can be used for automated processing and analysis of a large number of job applications. It can automatically screen out applications that do not meet the job requirements or have a low level of match to the criteria.
- AI can analyze candidate profile data and determine their skills, experience, and education to form a comprehensive competency profile that best fits the job requirements.
- AI can automatically scan and analyze resumes, highlighting key skills and experiences that match the company's needs.
- AI can be used to automate the initial stages of interviews, such as using chatbots or virtual assistants to ask candidates standard questions
- AI can analyze interview data and other input information to provide objective recommendations regarding each candidate's suitability.
- AI can be used to create interactive training modules or online courses to help new employees familiarize themselves with the company's culture, procedures, and policies.
- AI can provide personalized recommendations for training materials and learning methods based on individual needs and skills of new employees.
- AI can analyze employees' training needs and offer personalized career development plans, taking into account their professional goals and current skills.
- AI can be used to analyze employee productivity data and provide recommendations for individual motivation programs, including creating bonus programs and personalized career growth plans.
- AI can automate the collection and analysis of data on work productivity to identify trends, patterns, and opportunities for improving employee efficiency.



**Figure 5:** Algorithm for the development of a software tool for recruiting and HR management based on artificial intelligence

- AI can provide analytical reports and recommendations for individual meetings (1-2-1) and 360-degree assessments to facilitate the reporting and development planning process for employees.
- AI can analyze data on teamwork and recommend team-building strategies to improve communication, collaboration, and team effectiveness.

The proposed concept of a software tool for HR and recruiting management will allow to provide a complete personnel management process with the help of artificial intelligence, which will significantly increase the efficiency of the company's activities in general and work with personnel in particular.

Based on the created concept, we will develop an algorithm for creating a software tool for recruiting and HR based on artificial intelligence (Fig. 5):

- The initial stage is the definition of functional and technical requirements for the software tool. This includes analyzing user needs, defining system functionality, as well as technical specifications such as programming language, database, etc.
- The next step is to collect the necessary data for the development of the software tool. This may include candidate data, job vacancies, company profiles, organizational structures and other important information resources.
- At this stage, the collected data are analyzed and processed to determine relationships, patterns and trends. Artificial intelligence is used to automate this process and discover useful information.
- Based on the results of data analysis, models and algorithms are developed for forecasting and decision-making in the field of recruiting and HR. These models may include machine learning algorithms, neural networks, and other artificial intelligence techniques.
- Developed models and algorithms are tested on real data to verify their effectiveness and accuracy. Based on the obtained results, the software tool is improved and the models are adjusted.
- After successful testing, the software is implemented in the production environment. After implementation, support and maintenance of the software is provided to ensure its effective operation.

Traditional software tools for human resources management and recruitment typically rely on standard methods and procedures that require significant human involvement in candidate selection, resume analysis, and decision-making. While these tools can be effective, they are often limited in speed and accuracy, especially when processing large volumes of data.

AI-based software tools can offer several important advantages. The use of artificial intelligence allows for the automation of many processes, significantly increasing the speed and efficiency of work. For example, AI can quickly analyze thousands of resumes, selecting the most suitable candidates for a job opening, saving recruiters time and effort.

AI-based software tools can provide more objective recommendations and forecasts as they are based on the analysis of large amounts of data and use complex algorithms for decision-making. This helps to avoid human errors and increase the accuracy of candidate selection.

However, AI-based software tools may also have their drawbacks. They can be costly to implement and require significant investment in development and support. Additionally, they may be less flexible in usage as their functionality is based on predefined algorithms and models.

In comparison to traditional methods, AI-based software tools for human resources management and recruitment can offer significant advantages in terms of speed, efficiency, and objectivity. However, they may also require significant investment and have limited flexibility in usage.

The use of artificial intelligence (AI) software in recruiting and human resource management (HR) is extremely important and necessary. This allows you to automate and optimize the processes of personnel selection, training, development and motivation of employees. AI-based software ensures fast and efficient selection of candidates, analyzes data on work productivity and provides objective recommendations for career growth. This helps to improve the quality of



staffing, reduce the time and costs of recruiting and contributes to the overall success of the company in the market.

## Conclusions

The introduction of AI-based software tools into recruiting and human resource management is a big step forward in today's business environment. These technologies help optimize key processes related to the selection, training, development, motivation and analysis of personnel, ensuring greater efficiency and accuracy in decision-making. They allow you to automate many routine tasks, which frees up employees' time to solve more complex tasks and increases the efficiency of the entire process.

Artificial intelligence technologies also help in improving the quality of candidate selection, by analyzing large volumes of data and identifying the most suitable job applicants. This reduces the time required to attract new personnel and helps to increase the quality of the team.

The potential of AI-based software for recruiting and HR is great. They can become an integral part of HR strategy, helping companies to attract and retain talented employees, increasing competitiveness and driving innovation.

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