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ARTIFICIAL INTELLIGENCE MODEL FOR HUMAN CAPITAL MANAGEMENT

Summary

During the digital transformation, artificial intelligence technologies are actively developed and implemented in the organization's management processes. This trend also applies to human resource management. The purpose of this article is to substantiate the benefits of using artificial intelligence tools in human resource management for organizations. Current state of human resource management has been analyzed in the article, its main problems have been defined. The opportunities offered by artificial intelligence technologies offer in the field of human resources as well as the problems companies face in their implementation have been considered. Practical examples of the use of artificial intelligence tools such as chatbots, mood analysis technologies, voice assistants, facial recognition system in the field of human resource management have been given.

Keywords: artificial intelligence, chatbots, human resource management, human resources

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Intradaction

During the period of the establishment of the digital economy in the world, there are trends associated with changes in the role of humans in the activities of organizations [1; 3]. For Russia, increasing the efficiency of human resource management, as well as throughout the world, is one of the most pressing tasks of digitalization of the economy. Experts from the Rabota.ru service, which provides recruitment and job search services, conducted a study in December 2019, based on the results of which they predict in the coming years a high demand for highly specialized specialists, the transition of more employees to remote work, as well as the spread of new information technologies in the execution of business processes [7]. In this regard, organizational leaders need to have an understanding of modern

Analiz

The core of many new ICTs is artificial intelligence. Artificial intelligence is a set of technologies that can learn and perform tasks without human intervention. Each of the existing AI technologies (natural language processing, facial recognition systems, etc.) is powerful

individually, but when combined, they create unique opportunities to increase the productivity of employees in organizations.

The goal of human resource management is to ensure the use of company employees in such a way that the employer can receive maximum benefit from their skills and abilities, and employees can receive the maximum possible material, psychological and other satisfaction from their work [2]. AI tools help organizations achieve their goals in the field of personnel management (Human Resource Management, hereinafter referred to as HRM).

The purpose of this article is to substantiate the usefulness of organizations using artificial intelligence tools in human resource management. To achieve this goal, the following tasks were set:

- analyze the current state of HRM, identify the main problems in this area;
- consider possible ways to solve problems in human resource management using AI tools;
- consider the advantages and limitations when introducing AI technologies.

The object of the study is human resource management in modern organizations, and the

subject is the use of artificial intelligence tools in human resource management.

In the conditions of the modern digital economy, when the technical and technological equipment of manufacturers is almost the same, those companies that can more effectively use their available human resources can achieve success. In this regard, human resource management is one of the most important areas in the activities of organizations, the basis of business and its main factor of success [1; 3]. New information technologies offer hope for solving existing problems in the field of human resource management.

Let's consider the main problems in the field of HR (English human resources - human resources) that are relevant today.

1. Recruitment and selection of personnel.

Selecting new employees is a routine task. Most HR managers spend their time attracting candidates, reviewing resumes, conducting interviews, and informing candidates on any issues. At the same time, more than 72% of companies have difficulty finding candidates with the necessary skills [13]. Statistics show that companies spend on average from 14 to 63 days to fill their vacancies, and each vacancy costs the company approximately \$500 [12; 15].

2. Development and training of personnel.

The online education platform Udemy conducted independent research that showed that 84% of surveyed users believe that they lack certain professional skills [18]. This figure increased globally from 80% in 2017 to 84% in 2018. Study participants also noted that the skill areas they most need to focus on in education include technical skills, leadership and management, and productivity skills, interpersonal communication skills and other so-called soft skills. According to the heads of Russian companies, their employees' communication, creativity and flexibility skills are, on average, higher than what employers need. However, employees often lack sufficient domain knowledge, leadership and organizational abilities [17].

According to a Deloitte study, 79% of respondents in Russia and 76% of respondents worldwide prefer training existing employees to hiring new ones [9]. At the same time, 44% of

Russian employers are forced to enter the labor market due to the low rate of acquisition of new knowledge and skills by existing employees. In addition, spending on the global training and personnel development industry in 2017 amounted to more than \$200 billion [4]. However, about half of these funds were spent without the expected return. Despite the negative statistics, employee training is a way to invest in the success of an organization in the current and long term.

3. Employee involvement in work.

As mentioned earlier, managers strive to structure the HR management process in such a way that companies can get the maximum benefit from the skills and abilities of employees. This requires not only the loyalty of the company's employees, but also their high degree of involvement in work.

Engaged employees are interested in the company's success and are willing to invest their time and energy to achieve common goals. Gallup has found that high levels of engagement lead to decreased turnover, absenteeism, and other misconduct [6]. An Aon Hewitt study revealed a relationship between employee engagement and company profit [6]. It turned out that a 1% increase in engagement increases profits by \$20 million, a 5% increase increases profits by \$100 million, and a 10% increase increases profits by \$200 million. Profits grew in companies regardless of their size.

According to Gallup, only 15% of workers worldwide are engaged at work, and 10% in Eastern Europe [16]. The results of these studies show that engagement management opens up enormous prospects for organizations for further growth and requires new approaches to solving existing problems in the field of personnel management.

Artificial intelligence technologies can be the key to solving current problems in human resource management. The use of artificial intelligence tools in HRM comes down to automating part of HR processes, allowing algorithms to perform both routine and complex analytical work. This frees up the time of HR specialists to perform strategic and current management tasks.

There are dozens of HR processes that companies can improve dramatically. The following questions arise. Which of these processes are suitable for automation? Which ones are the priority? It is important to remember that the tasks that need to be automated first are those that are repetitive and have a large amount of information, as well as those tasks that are prone to errors due to the rate of change and the volume and variety of data.

Let us consider in more detail the priority tasks of HRM, in which there is an active use of artificial intelligence technologies (hereinafter referred to as AI).

1. Analysis of employee mood.

The concept of employee sentiment analysis is quite simple: you need to analyze large volumes of textual information and divide them into categories based on moods or attitudes. Understanding employee sentiment throughout the company, as well as by department or location, helps create a better environment for employees to work and meet their needs. This is possible by combining natural language processing and machine learning technologies. Algorithms work with unstructured information obtained from employee conversations, emails and other incoming information. In addition, machine learning is used to train the system on words that may indicate some problems. One example of a platform that allows you to analyze the mood of employees using AI technologies is the Xander AI solution from Ultimate Software. The goal of the system developers is to combine analytics with emotional intelligence, which helps to obtain a fairly accurate picture of what is happening in the organization. The system receives data from comments on the company intranet, as well as feedback from employee surveys. The machine learning in the Xander solution is “trained” to such an extent that it is able to draw conclusions about the mood of both individual employees and assess the overall mood of the staff in the company.

2. Voice assistants and verbal communication.

While email communication is one of the most commonly used tools for employee engagement, there is no substitute for face-to-face communication. Verbal communication has

always been and will be the fastest and most effective way of interaction, but currently one of the participants in the interaction may be AI, not a person. Many people already use voice applications on mobile devices. These technologies can also be useful for the HR field.

AI technologies used in voice assistants can be useful in employee training. For example, a voice assistant could listen to calls made by the sales team and then make suggestions on how to improve sales performance. The voice assistant can also listen

conversation between managers and subordinates and then provide them with recommendations for developing communication and management skills. However, there are legal and ethical limitations to the spread of this AI technology. At the same time, the voice assistant is a prime example of how useful AI technologies can be for the development of the HR field.

3. Development and training of personnel.

Previously, the use of voice assistants in employee training was considered, but there are other training options using AI technologies: AI solutions can track the work of individual company employees, comparing them with the most successful specialists; Then, based on the analysis of the collected data, AI algorithms are able to develop a personalized training program for employees.

Chatbots can also be used to train company employees. Chatbots help new employees get accustomed to the company faster, since these devices are available around the clock and can answer many questions about working in the company. One of the most significant areas in which bots can help employers is increasing the speed of implementation and mastery of new information technologies. Chatbots are intuitive and easy-to-use tools and make the transition to new technologies much easier.

An example of a chatbot for training is WalkMe, which helps employees learn new technologies. The bot has no software interface and uses a natural language chat interface. The system uses a combination of artificial intelligence and analytics to predict user behavior and offer step-by-step assistance in mastering new technologies. Using WalkMe

helps users complete tasks without any training, even as they navigate between different software tools.

4. Recruitment and selection of personnel.

Bots can also be used in personnel selection. One of the benefits of using bots to communicate with candidates is the ability to customize the speech and wording of the interactive assistant in accordance with the norms accepted in the organization's culture. For example, if an organization wants its culture to be perceived as creative or democratic, the bot can be programmed to be funny, friendly, and convey the company vibe when interacting with candidates and employees. This approach allows you to build closer contact with candidates and, accordingly, gain advantages in the competition for talent.

Facial and emotion recognition algorithms are used to conduct video and regular interviews when selecting personnel. They are able to process video and determine whether the interlocutor is looking at the camera or reading the script behind the scenes. The system analyzes the position of the eyes and the direction in which the applicant is looking. She can also make notes if a person is suspected of potentially cheating. Examples of such HR systems are HireVue, Skillz.

In addition to personnel selection, facial recognition systems in HRM can be used for other purposes. Some companies have implemented systems that record employees' arrival at work. This helps the company not only track working hours, analyze attendance records, but also ensure the security of the office.

In 2019, Gartner published a study reporting that only 17% of organizations are using AI solutions to perform HR functions, and another 30% expect to do so by 2022 [11]. The reason is that many companies face the following problems.

1. Funding AI initiatives.

It can be difficult to quantify the benefits of implementing AI in HRM. The rationale for AI investments and possible outcomes must be verified before technology is deployed. Higher priority should be given to projects that help solve critical problems, such as improving

decision making, speeding up employees, or making management more efficient.

ROI can be used to quantify investments in AI. Management must see the connection between AI applications and the business results that arise from them. An assessment might look like this: First, the relationship between the results of using AI solutions for human resource management with HR metrics, which in turn affect financial

indicators. A good example of how such an assessment scheme works is IBM's AI candidate search system. Their decision contributed to a significant increase in the number of candidates to work for the company. The application allows you to quickly process a large number of candidate resumes, which has increased the speed of attracting candidates, as well as their quality. As a result, in 2017, IBM was able to save \$107 million in human resource management alone thanks to AI [14].

2. Security and privacy issues.

To operate AI algorithms, large amounts of data are used, which must be reliably protected. The information technology security department should develop appropriate guidelines for working with AI technologies, which relate not only to aspects of data security, but also to legal and ethical issues. AI tools such as chatbots should not store any personal data or sensitive information while processing employee requests. This information must be transmitted via secure data transfer protocols and be encrypted to prevent data theft by third parties. To train algorithms, you should use data that does not contain personal information and confidential information about employees. Finally, companies must ensure they have the necessary controls in place over HR data. The lack of such control can lead to erroneous algorithms and, accordingly, incorrect management decisions. Therefore, when working with HR systems that contain AI technologies, employees must have authorized access to information.

3. The difficulty of integrating AI into existing infrastructure.

The difficulty of integration lies in the fact that modern AI solutions for personnel management are narrowly focused. Before

deciding to integrate AI solutions into the infrastructure, it is necessary to first test them in operation, taking into account the culture and business model of the company.

4. Routine maintenance.

Despite the fact that modern technology is quite reliable, there is always the possibility of accidents and malfunctions. There is also the possibility of hacker attacks. Therefore, AI technologies require deep study, constant analysis and updating.

5. Lack of qualified workers.

In the labor market, it is still difficult to find specialists with the necessary education and skills to develop, debug and implement AI technologies.

6. Concerns about rising unemployment due to the introduction of AI in organizations also remain an important issue. The World Economic Forum produced a report, "The Future of Jobs," which predicts that by 2022, the number of jobs will be lost by about 75 million, while about 133 million new jobs will be created thanks to AI [19]. These jobs will involve preparing machines to work effectively in a digital community, as well as analyzing and teaching AI human skills such as critical thinking, empathy and problem solving.

It is unlikely that HR departments will be automated in the next few years, but AI could completely take over HR tasks such as searching for candidates (63%), attracting applicants (47%), and training employees (47%) [8].

Let's summarize the benefits of using AI technologies in HR. In 2019, KPMG conducted a study that showed that 88% of respondents who had already invested in AI considered the investment worthwhile. Of these, 35% focused on training, and 33% on analytics [5]. Let's consider the priority business indicators that are affected by the use of AI tools.

1. Productivity.

The developers of the Zoom.ai chatbot (scheduling virtual meetings and simplifying collaboration for remote work) conducted a study and found that users who actively use the chatbot usually save up to 25 hours per month, and companies save an average of about \$16 thousand US per employee with a salary of 100 thousand US dollars. If we consider these

indicators on a scale of hundreds or thousands of enterprise users, the value of this tool for business and HR becomes obvious [10].

2. Rate of implementation.

This indicator is difficult to assess, but it is also important. The use of chatbots simplifies the transition to using new systems, since communication with them can replace the use of help manuals.

An example of the influence of AI on the speed of introduction of new technologies into a company is the WalkMe chatbot discussed earlier.

3. HR productivity.

The use of AI tools allows some non-urgent or less important tasks to be completed without human intervention, allowing HR managers to focus on urgent and more important tasks. Thus, all existing tasks of the HR department are systematically solved, and the HR manager does his job more efficiently.

4. Retaining valuable employees.

Artificial intelligence tools help support employee development, which increases their job satisfaction, and therefore increases their loyalty to the organization. AI tools can also analyze the mood of employees, helping managers prevent the dismissal of valuable employees.

Conclusion

The conducted research allows us to substantiate the usefulness of using artificial intelligence tools in human resource management. AI technologies enable companies to free HR specialists from routine tasks, optimize and automate many HR processes, increase labor productivity and data processing speed.

At the same time, companies need to soberly determine the feasibility of using AI technologies. Before their implementation, it is necessary to evaluate the return on investment, as well as develop regulations for working with AI tools that will affect the technical, legal and ethical aspects of the company's activities.

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İNSAN RESURSLARININ İDARƏ EDİLMƏ PROSESİNDƏ SÜNİ İNTELEKTİN İSTİFADƏSİ

Xülasə

Rəqəmsal transformasiya dövründə süni intellekt texnologiyaları fəal şəkildə inkişaf edir və təşkilatı idarəetmə proseslərinə daxil edilir. Bu tendensiya insan resurslarının idarə edilməsi proseslərinə də şamil edilir. Məqalənin məqsədi insan resurslarının idarə edilməsində süni intellekt alətlərindən istifadə edən təşkilatların faydalılığını əsaslandırmaqdır. Məqalədə insan resurslarının idarə edilməsi sahəsində mövcud vəziyyət təhlil edilir və onun əsas problemləri müəyyən edilir. Süni intellekt texnologiyalarının insan resursları sahəsində açdığı imkanlar, eləcə də onları tətbiq edərkən şirkətlərin qarşılaşdıqları problemlər nəzərdən keçirilir. İnsan resurslarının idarə edilməsi sahəsində chatbotlar, əhval-ruhiyyənin təhlili texnologiyaları, səsli köməkçilər, üz tanıma sistemləri kimi süni intellekt vasitələrinin istifadəsinə dair praktiki nümunələr verilmişdir.

Açar sözlər: səs köməkçiləri, süni intellekt alətləri, süni intellekt, kadr hazırlığı

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МОДЕЛЬ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА ДЛЯ УПРАВЛЕНИЯ ЧЕЛОВЕЧЕСКИМ КАПИТАЛОМ

Резюме

В ходе цифровой трансформации технологии искусственного интеллекта активно развиваются и внедряются в процессы управления организацией. Эта тенденция также касается и управления человеческими ресурсами. Цель данной статьи — обосновать преимущества использования инструментов искусственного интеллекта в управлении персоналом организаций. В статье проанализировано современное состояние управления персоналом, определены его основные проблемы. Рассмотрены возможности, которые предоставляют технологии искусственного интеллекта в сфере управления персоналом, а также проблемы, с которыми сталкиваются компании при их внедрении. Приведены практические примеры использования инструментов искусственного интеллекта, таких как чат-боты, технологии анализа настроения, голосовые помощники, системы распознавания лиц в сфере управления персоналом.

Ключевые слова: искусственный интеллект, чат-боты, управление человеческими ресурсами, человеческие ресурсы.

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