Artificial Intelligence Systems in Human Resource Management: Potential Advantages and Conditions for Their Implementation

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Abstract— **The main directions of using artificial intelligence systems in the field of human resource management are considered. The potential opportunities and advantages, as well as legal, psychological and ethical problems associated with the use of artificial intelligence in this area are presented. It is shown that working with artificial intelligence systems requires the optimization of existing and the development of new, including cross-cutting, competencies, the possession of which will allow employees to be more productive and innovative, maintain employment opportunities and competitiveness. It is shown that end-to-end competencies are not only necessary for working with artificial intelligence, but they themselves can be developed and improved with the help of artificial intelligence.**

Keywords—**artificial intelligence, human resource management, transversal competencies.**

I. INTRODUCTION

Until recently artificial intelligence (AI) technologies were used to automate various back-office processes (data entry, document management, customer service and accounting, etc.) [1, 2]. The main technological breakthrough of recent times has been generative artificial intelligence (GAI) - an advanced AI model that can analyze large amounts of data and machine learning algorithms, generate new original content based on this data, and also identify patterns and make informed decisions.

In today's business world, AI-based technologies have already become an integral part of human resource management and development. IBM estimates that the cost savings from the use of artificial intelligence in the field of personnel management is approaching $100 million per year [3]. The GAI has the potential to have a significant impact in this area.

Realizing the benefits of AI will require addressing legal, psychological and ethical challenges, and investing in training and development programs that will help workers acquire the skills they need to effectively use new technologies.

II. PERSPECTIVES AND PROBLEMS OF APPLICATION OF AI SYSTEMS IN HRM

Organizations have yet to experience the expected benefits of AI adoption. In human resource management (HRM), solutions based on artificial intelligence (AI) can help optimize many traditional processes, such as recruitment, onboarding, performance management, training and development, etc., (Fig. 1).

Recruitment
- Use AI tools to automate tasks such as resume screening, interview scheduling, and recruitment.
- *Expectations*: Accelerate and improve the accuracy of the hiring process, and reduce the burden on HR teams

Predictive analytics
- Using AI-driven predictive analytics to assess candidate information and identify high-quality candidates who are more likely to become top performers
- *Expectations*: More accurate posting of job postings and identification of candidates who may have been overlooked in the traditional hiring process

Interaction with candidates
- Using chatbots to automate initial interactions with candidates, answer frequently asked questions, and provide feedback to candidates in real time.
- *Expectations*: A more personalized and efficient candidate experience; freeing up HR teams to focus on more strategic activities

HR branding
- Using AI to position the company's culture, values, and benefits across platforms and channels.
- *Expectations*: increase company awareness, attract more highly qualified candidates

Adaptation
- Using AI to automate and simplify manual, time-consuming steps to update databases.
- *Expectations*: Providing a customized onboarding experience based on the unique requirements and preferences of each new hire; accelerating the adaptation process

Training & Development
- Using AI technologies to develop personalized employee training programs based on their personal performance information.
- *Expectations*: increased employee engagement and productivity; saving time and resources of HR team

Diversity and Inclusion
- Using AI is possible to reduce bias by analyzing data to identify potential areas of bias and provide suggestions for improving diversity and inclusion.
- *Expectations*: Formation of a diverse and innovative workforce that contributes to the success of the company.

Figure 1. Main directions of AI in HRM [4, 5, 6]

AI-based solutions are used to identify potential candidates with the skills and experience required for the job. AI has the ability to quickly and accurately analyze

candidate data using advanced algorithms and machine learning capabilities, which allows you to identify the best candidates faster than recruiters.

AI can provide valuable information about a candidate's workplace behavior and personality, using factors such as language analysis, tone of voice, and facial expressions that a typical recruiter might not recognize from a resume.

By automating routine functions (filling out paperwork, setting up accounts, and conducting training), AI can help speed up the onboarding process. This allows HR professionals to focus on the more strategic aspects of the onboarding process, such as connecting with new hires and assimilating them into the culture of the organization.

AI is revolutionizing the entire learning and development process, helping companies continually train their employees in new skills and knowledge. AI-driven algorithms can evaluate the knowledge, skills, and experience of all employees and deliver targeted learning content tailored to individual needs, preferences, and learning styles. This allows employees to quickly and effectively improve their skills.

By analyzing employee data such as performance metrics and engagement surveys, AI-powered tools can identify skill gaps and areas for improvement. It helps HR professionals develop customized L&D programs tailored to the specific requirements of their workforce.

AI can be used for a variety of employee engagement tasks, such as conducting smart surveys, providing real-time feedback, and offering rewards and recognition. In addition, AI can use sentiment analysis to determine how engaged and motivated employees are.

AI can also be a powerful factor in determining the right team composition by analyzing employee motivation and exploiting results, assist in career planning by monitoring and evaluating employee performance to detect any signs of stagnation or depression.

A new branch of AI - GAI has the potential for even more significant changes in the field of HRM [7]:

- creation of accurate and realistic job descriptions based on the competencies and behavior required for each position
- modeling of skills, experience and creation of profiles of candidates for selection of personnel for certain working conditions
- benchmarking wages, external labor market data to help establish competitive and fair pay, rewards, incentives and other benefit programs
- personalized coaching and leadership development
- maintaining mental health and well-being.

At the same time, the already existing experience of using AI technologies in HRM allows us to highlight not only potential benefits, but also problems that need to be solved (Fig. 2).

Research has also shown that organizations often find it difficult to integrate AI into their business processes and systems [11, 12].

One of the problems in the field of HRM associated with the use of AI technologies is the transformation of the necessary competencies of personnel, including specialists from HR teams, for the implementation and use of AI systems in organizations.
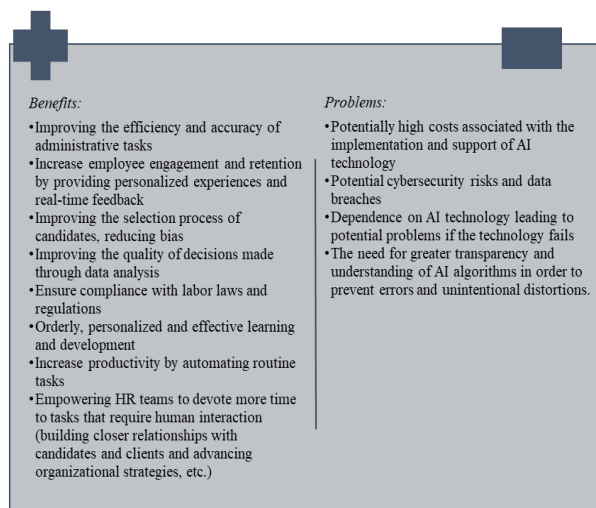

Figure 2. Potential benefits and challenges of using AI in HRM [8, 9, 10]

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III. AI SYSTEMS AND WORKERS' COMPETENCIES

AI allows you to automate certain functions and processes, freeing up time and resources for people to focus on more complex and high-level tasks. This, in turn, requires the optimization of existing and development of new competencies, the possession of which will allow employees to be more productive and innovative, maintain employability and competitiveness.

Competence describes the combination of skills, attitudes, and behaviors that an individual possesses or that an organization expects from a particular employee. Digital competencies (including the creation of digital content, including programming, the ability to understand the results generated by algorithms to inform and support decision-making, virtual teamwork, the use of big data and new devices and applications of information and communication technologies, security, including cybersecurity-related competencies, etc.,) are now required in order to realize the full potential of AI.

At the same time the integration of AI systems in organizations creates the prerequisites for the increasing importance of developing cross-cutting cognitive and non-cognitive competencies (critical thinking, problem solving, communication and collaboration, influence-based leadership and leadership by others, flexibility and adaptability, self-management, the ability to learn and recognize one's own knowledge gaps, empathy, etc.,) [13, 14], which are necessary for effective work with AI systems. They enable workers to adapt to new technologies and processes, constantly learn and evolve in the face of rapidly changing technologies and perform tasks that machines cannot. In addition to being important for working with AI systems, cross-cutting competencies can also be developed and improved with the help of AI.

Thus, recent research shows that thinking competencies are crucial for effective work with AI systems [15, 16]. Analytical, critical and fast thinking enables employees to understand the data and insights generated by the AI system and use that information to make informed decisions.

Using AI is critical to improve both the ability to understand, speak, read and write in multiple languages, as well as the ability to work with numbers and units, as well as use devices and applications. For example, many AI tools and platforms have user interfaces and documentation in English, so employees who are fluent in English can better navigate and use these tools [17]. In addition, employees who are good with numbers and measurements can better understand and use machine learning algorithms to predict outcomes, classify data, or optimize processes.) Similarly, employees who are skilled in the use of digital devices and applications will be better able to manage and maintain AI systems.

AI systems have the potential to reduce the time it takes to complete certain tasks. This allows employees to use their time as productively and efficiently as possible, to focus on tasks that require creativity, innovation or other qualities inherent only in humans. AI systems can provide personalized suggestions to employees on how to better manage their time, set goals, and prioritize tasks, helping them manage workflows. AI-enhanced self-management competencies could be an important part of an organization's strategy to create value.

AI systems are often complex and can be difficult to understand. The development of effective communication competencies is essential for sharing information on the use of complex AI systems and building confidence in the work of AI. At the same time, AI systems can help managers and employees improve their social and communication skills by providing feedback on their online interactions, helping them identify potential communication issues, and providing tools to improve communication.

Strong leadership competencies can be critical to overcome challenges or hurdles a team may have when working with AI. AI systems can provide managers with real-time feedback on their work, personalized guidance and advice to help them improve their leadership competencies and gain insight into team dynamics to better understand how their employees interact with each other and how to guide them through effective communication.

The impact of AI on the required competencies of workers varies by job skill level [18]. For example, using AI to support decision-making in high-skill jobs could lead to less autonomy, but also faster pace of work, less monotony, more learning. In mid-skill positions, the impact of using AI for decision making is similar, although to a lesser extent, while using AI for issuing instructions results in faster work pace, more autonomy, and less learning. For low-skill jobs, using AI for decision making is irrelevant, and using AI for issuing instructions increases the pace of work.

These results point to the need to consider specific contexts and skill levels when implementing AI systems in the workplace.

IV. CONCLUSION

The introduction of AI allows you to automate tasks that are currently performed by humans, or reduce cognitive load, lead to increased productivity and efficiency. But the changes already manifested and coming will have serious consequences for organizations and workers.

Historically all technologies go through an adaptive phase when users become familiar with them, realize their usefulness and create methods to protect against their unintended but inevitable harmful effects.

Organizations need to be aware of the challenges they must overcome to ensure that their employees truly have the competencies needed to enable AI to contribute to their competitive advantage. Some of these obstacles are outdated IT infrastructure, the complexity inherent in AI itself, lack of necessary competencies in employees and organizational culture that do not contribute to the development and implementation of AI.

AI needs to be implemented thoughtfully and consciously managed to provide all workers with an equal opportunity to learn and develop a set of required competencies.

REFERENCES

[1] D. Butler, Tomorrow's world: Technological change is accelerating today at an unprecedented speed and could create a world we can barely begin to imagine, *Nature*, vol. 530(7591), pp. 398-402, 2016.

[2] A. Jaiswal, C. J. Arun and A. Varma, Rebooting employees: Upskilling for artificial intelligence in multinational corporations, *International Journal of Human Resource Management*, vol. 33(6), pp. 1179-1208, 2022.

[3] A. Charlwood and N. Guenole, *Can HR adapt to the paradoxes of artificial intelligence?* Human Resource Management Journal, vol. 32(4), pp. 729-742, 2022.

[4] R. S. Peres, X. Jia, J. Lee et al., Industrial Artificial Intelligence in Industry 4.0 - Systematic Review, Challenges and Outlook, *IEEE Access*, vol. 8, pp. 220121-220139, 2020.

[5] P. Mikalef and M. Gupta, *Artificial intelligence capability. Conceptualization, measurement calibration, and empirical studyon its impact on organizational creativity and firm performance.* Information & Management, vol. 58(3), p. 103434, 2020.

[6] D. Vrontis, M. Christofi, V. Pereira et al., *"Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review"*, International Journal of Human Resource Management, vol. 30(3), pp. 1-30, 2021.

[7] J. Bersin. The Role Of Generative AI And Large Language Models in HR. [Online]. Available: https://joshbersin.com/2023/03/the-role-of-generative-ai-and-large-language-models-in-hr/.

[8] R. H. Hamilton, H. K. Davison. Legal and ethical challenges for HR in machine learning. *Employ Respons Rights J.*, vol. 34, pp. 19–39, 2022.

[9] P. T. Kim, M. T. Bodie, Artificial intelligence and the challenges of workplace discrimination and privacy. *ABA J. Lab. Employ. Law*, vol. 35(2) pp. 289-315, 2021. [Online]. Available: https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=153136618&site=ehost-live&scope=site.

[10] Y. Acikgoz, K. H. Davison, M. Compagnone, M. Laske. *Justice perceptions of artificial intelligence in selection,* Int. J. Sel. Assess., vol. 28(4), pp. 399-416, 2020. [Online]. Available: https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=146948217&site=ehost-live&scope=site

[11] T. H. Davenport and R. Ronanki, Artificial intelligence for the real world, *Harvard Business Review*, vol. 96(1), pp. 108–116, 2018.

[12] P. Mikalef, J. Krogstie, I. O. Pappas and P. Pavlou. Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities, *Inf. Manag.*, vol. 57, no. 2, p. 103169, 2020.

[13] J. Hart, M. Noack, C. Plaimauer and J. Bjørnåvold, Towards a structured and consistent terminology on transversal skills and competences. Brüssel: Europäische Kommission und Cedefop.

Towards a structured and consistent terminology on transversal skills and competences| Esco (europa. eu). [Online]. Available: https://esco.ec.europa.eu/uk/publication/towards-structured-and-consistent-terminology-transversal-skills-and-competences

[14] G. Margarov and V. Konovalova, "Interdisciplinary Competencies Needed for Engineers in the Digital Economy," 2019 Computer Science and Information Technologies (CSIT), Yerevan, Armenia, pp. 144-147, 2019.

[15] N. Delanoy and K. Kasztelnik, Business open big data analytics to support innovative leadership and management decision in Canada, *Business Ethics and Leadership*, vol. 4(2), pp. 56-74, 2020.

[16] T. Süsse, U. Wilkens, S. Hohagen and F. Artinger, Digital competence of stakeholders in Product-Ser vice Systems (PSS): Conceptualisation and empirical exploration. *Procedia CIRP*, vol. 73, pp. 197-202, 2018.

[17] C. B. Irawan, B. Sasongko, and I. A. Afriani, The role of English and technology on human performance in international business, *International Journal of Applied Business and International Management (IJA BIM)*, vol. 7(2), pp. 30-40? 2020.

[18] J. R. Holm and E. Lorenz, The impact of artificial intelligence on skills at work in Denmark. *New Technology, Work and Employment*, vol. 37(1), pp. 79-101, 2022.