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## Use of New Technologies in Human Capital Management: Theoretical Background

**Abstract**

The article is devoted to the theoretical justification of the effectiveness, importance, advantages, directions and dangers of introducing the latest digital technologies into human capital management at the enterprise level. The purpose of the work is to generalize the theoretical foundations, systematize the key advantages, and justify ways to increase the effectiveness of introducing the latest technologies into the practice of human capital management of enterprises in modern conditions. To achieve the set goal, the following research methods were used: comparative analysis – to reveal the essence and characteristic features of key concepts; abstract-logical method – to systematize the key advantages of digital technologies in human capital management; monographic method – for in-depth study of individual types of modern personnel technologies, etc. The study showed that a human capital management system based on the latest technologies helps to improve the process of retaining talented employees; optimize labor and organizational management processes; ensure better working conditions for employees; increase labor productivity; save costs and company resources; save time on routine tasks and expand employees' opportunities to focus on more important strategic initiatives; increase employee engagement; better compliance with regulatory and legislative requirements; ensure business agility; increase employee motivation; expand analytics capabilities; better talent management; reduce staff turnover; reduce administrative process cycles and increase the accuracy and efficiency of all human capital management functions, which all together affect the company's performance. Important results are defining the essence of digital transformation in HCM and highlighting the ethical aspects of this process. Transparency, fairness and accountability are crucial to ensuring the effectiveness of the use of digital technologies in human capital management. In particular, human oversight and intervention are necessary to verify the recommendations and decisions generated by artificial intelligence. Moreover, companies should prioritize employee well-being and ensure that artificial intelligence technologies enhance, rather than replace, human interaction. Overall, digital transformation in HCM can become and is already becoming a powerful lever for improving the effectiveness of human capital management in enterprises

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**1 Introduction**

The intensity of the introduction and use of new technologies in all spheres of socio-economic life has caused changes not only in the business processes of modern enterprises, but also in the organization of the labor process, making it necessary to rethink the most important competence-psychological characteristics of employees, the system of training and development of human capital of companies, corporate values, etc. Transformations in human capital management at domestic enterprises under the influence of digital technologies have acquired new levels and forms of functioning, therefore their research is of important theoretical and applied significance.

**Keywords**

human capital, human capital management (HCM), HR technologies, digital technologies, digital human capital management, digital transformation in HCM

**JEL:** J24, M12, O33



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The introduction of the latest technologies in human capital management at the enterprise is a strategic decision that meets the challenges of the digital economy and allows a modern enterprise to optimize processes, increase efficiency and create competitive advantages in a rapidly changing economic environment. The use of revolutionary technologies in human capital management (in particular, such as artificial intelligence, big data, blockchain and cloud technologies) opens up new horizons for increasing the efficiency of business processes of modern companies and, at the same time, for analyzing and forecasting employee needs, developing talents, increasing the level of satisfaction and engagement of personnel. At the same time, the integration of modern

technological solutions in human capital management not only transforms the organizational structure of management, but also forms a highly productive team capable of achieving ambitious goals and successfully competing in the market.

These socio-economic processes determine the relevance of research into the transformation of the HR sphere of modern enterprises and require the search for ways to increase the efficiency of implementing new technologies in the practice of human capital management.

Many scientists are engaged in studying individual aspects of the implementation of new technologies in the processes of human capital management at the enterprise, in particular: N. Azmuk, O. Grishnova [1], O. Bayraktar [2], R. Bhuvaneshwari [3], I. Kalenyuk [7; 8], O'Connor, S. [11], Rinaily Bonifacio [12], Zhang, J., Chen, Z. [13] and others. Despite the rather deep coverage in the economic literature of the modern features of the use of the latest technologies in the labor sphere, the issues of revealing the essence of the current concept of digital transformation in personnel management still remain unexplored. The key advantages of using digital technologies in human capital management also require systematization; justification of how the introduction of innovative technologies in the HR sphere will help support complex processes at domestic enterprises and contribute to increasing the efficiency of human capital use.

The *purpose of the work* is to generalize theoretical principles, systematize key advantages, and justify ways to increase the efficiency of implementing new technologies in the practice of human capital management of enterprises in modern conditions.

## 2 Key Advantages of Digital Technologies in Human Capital Management

The key reasons for the modernization of technologies and tools for human capital management (HCM) are the transition to a new model of modern business development – the VUCA concept (volatility; uncertainty; complexity; ambiguity), digitalization and technologization of the economy and the entire system of social and labor relations. The related fundamental shifts in the nature of work, new technologies and the needs of new generations of employees are changing the processes of work performance, methods of employee engagement and the activities of companies in general. At the same time, under the influence of global external factors, the workforce is becoming increasingly dispersed, companies have to combine the problems of managing local and remote teams, maintaining productivity and engaging remote workers, as well as complying with a wide range of labor laws.

HR technology has evolved rapidly in recent years. Automating repetitive tasks such as data entry and

scheduling is a key feature of modern HR technology. By eliminating manual work, HR professionals can focus their efforts on strategic initiatives that move the business forward. Streamlined onboarding processes use automation to seamlessly guide new employees through the necessary paperwork and training, ensuring a smooth transition into their roles.

In addition, real-time access to employee data gives HR teams up-to-date information for decision-making and enables them to provide personalized support when needed. Through these improvements in efficiency and productivity, HR technology is revolutionizing the way companies manage their workforce to succeed in the digital age.

HR technologies also include a range of digital tools that use automation, artificial intelligence and advanced technologies to improve decision-making in human resource management. These solutions streamline processes such as talent acquisition, onboarding, performance management, employee engagement. They offer features such as automated recruitment workflows, AI-based analytics for workforce analysis and self-service portals that enable employees to easily access information.

The use of new HR technologies is important for talent management (for which advanced companies are currently competing), making strategic decisions under conditions of uncertainty and the overall success of any modern enterprise in the conditions of total digitalization of the economy. The latest technologies allow HR managers to carry out effective selection and adaptation of employees with minimal time and money, develop effective motivation mechanisms based on the results of objective personnel assessment, organize a continuous process of training and advanced training of employees, and also digitize many other processes. All this contributes to the growth of staff satisfaction and loyalty and the maintenance of a moderate impact of the global economic environment and digitalization on the enterprise as a whole as it continues to transform.

Thus, the latest human capital management technologies have a number of key advantages that increase the efficiency of work in the enterprise:

1. Improving talent retention. New technologies help improve human capital management by providing detailed information about an organization's workforce, which helps create personalized experiences and thus increases job satisfaction. Using HCM technologies also significantly reduces employee turnover by helping HR professionals better understand their employees and create a valuable work environment. These benefits help companies build healthy relationships with their employees, which further increases their productivity and success in the long run.

2. Process Optimization: HCM enables businesses to optimize and automate processes such as recruitment, onboarding, training, employee data management, talent management, etc. This helps companies save time by eliminating manual tasks and provides

an efficient way to manage employee data in one centralized cloud repository. HCM technologies also improve the accuracy of data entry for more effective decision-making, with data collected in real-time.

3. Increased work efficiency. A comprehensive HCM system helps companies become more efficient and productive, which allows them to better manage their human resources. The latest technologies provide HR managers with automated tools that help them assign tasks, track progress, and ensure that everyone is working on projects that match the employee's skill level. HCM technologies also provide the ability to create analytical reports that help companies make decisions based on analytical data and identify areas for improvement, increasing the company's efficiency and contributing to cost savings in the long run [12].

4. Cost savings. Human capital management technologies increase efficiency and accuracy by automating HR operations, which contributes to a significant reduction in labor costs compared to using disparate systems separately to manage different tasks in the company's HR department. In addition, investments in HCM technologies eliminate the complex software costs associated with separate modules that are not needed when all tasks are concentrated in a single human capital management system.

5. Increase employee engagement. HR professionals can increase employee engagement by leveraging the capabilities of HCM technologies that manage the entire employee lifecycle. Using automated processes and personalized experiences helps create a workplace where employees feel valued. This can increase loyalty, motivation, and job satisfaction, increasing productivity. HCM technologies also provide insight into employee performance, allowing managers to identify areas for improvement and develop strategies to develop them. The ability to track employee performance in real time also helps create an atmosphere of open communication, promoting employee engagement.

6. Best-in-class compliance with regulations and laws. HCM technologies help automate and simplify tasks like payroll, while ensuring companies are compliant with the latest regulations and laws related to payroll taxes and other mandatory withholdings. This helps companies stay competitive and enables managers to ensure that their employees are informed and motivated throughout the entire employment lifecycle. So, by making well-informed decisions based on the latest HCM technologies, employers can improve efficiency and achieve the best results by maximizing the use of the company's human capital [12].

7. Scalability. With the latest HR technologies, businesses can scale their operations as their workforce grows.

8. Talent Management. Using HCM technologies also helps companies better manage their workforce, enabling HR managers to identify and develop high-

potential employees. HCM offers tools such as training programs, performance reviews, and career development planning that can help grow the best talent within the company. It also helps employers build a productive and effective team to maximize the potential of their human capital.

9. Reward and recognize employees. HCM technologies also provide employers with a framework for recognizing and rewarding high-performing employees (for example, by creating reports to compare employee performance and identify areas for improvement). This can be achieved through performance tracking, bonus programs, and other incentives. By offering appropriate rewards and recognition, employers create a motivating environment that helps drive optimization and productivity.

10. Enhanced analytics capabilities: By providing real-time access to employee productivity and engagement data, HCM technologies enable companies to gain valuable insights into how to best improve employee productivity. This can help businesses develop strategies to optimize their human resources for maximum efficiency.

11. Ensuring business agility. The pace of change in the activities of business structures both domestically and globally is accelerating every year, and the processes of mergers, acquisitions and sales of companies are taking place at a record level. In such conditions, the ability to quickly recognize market changes, respond to them and, accordingly, adapt becomes an important imperative in modern conditions. HR departments with HCM systems are breaking ahead due to improved performance management, wider opportunities for managing bonuses and benefits, payroll processes, etc. These achievements enable companies to increase business flexibility, meeting both current and future requirements of a changing economic environment.

### **3 The Essence of Digital Transformation in Human Capital Management**

Digital transformation is a key organizational shift caused, enabled, or supported by digital technologies that radically change the way business operations are conducted. Digital transformation changes the way an entire enterprise operates, especially business processes and tasks. Driven by a changing socio-economic environment, digital transformation is realized through the application of digital initiatives and innovative technologies to implement important reforms in the way business is managed, leading to significant changes not only in the enterprise and industry, but also in the economy as a whole.

Digitalization differs from digital transformation, which is defined as the ability to convert available products and services into a digital format that provides a greater advantage than a physical product [5].

Thus, digital technologies already at the introduction stage not only contribute to cost savings, but also improve the customer service process and the internal management system.

Digital human capital management is a process optimization that uses social, mobile, analytics, and cloud (SMAC) technologies to make the management process more efficient, effective, and connected [13].

In the context of the general digitalization of the economy, human capital management has revolutionized the way companies manage their employees. According to the HCM approach, which views employees as a valuable asset similar to financial and physical resources, the enterprise uses integrated software to automate and optimize various HR functions. HCM integrates employee information across core HR and talent management systems, providing a comprehensive solution for recruitment, performance management, training and compensation management, career planning and succession, etc. This holistic approach has led to significant improvements in efficiency and productivity in enterprises around the world.

We understand the digital approach to HCM strategy as human capital management based on digital technologies to improve the efficiency of HR processes. Digital HCM saves time and increases the productivity of managerial functions, human capital management processes become simpler and faster thanks to digital transformation, which allows HR specialists to improve work processes and focus on more important tasks and creative initiatives in their functional areas. This means that the digital transformation of HR functions has a greater effect than the usual increase in efficiency.

Digital integrated business processes of human capital management increase the productivity of information systems functions, their transparency, make it possible to control labor force indicators in real time and track and optimize costs. In general, digital technologies used today in the field of human resources management are aimed at identifying, collecting, modeling and predicting data in order to increase the efficiency of the enterprise.

Human capital management is one of the areas where it is possible to digitize, to one degree or another, almost all functions and the employee lifecycle. Industry giants such as Oracle, Workday and SAP currently share the market with specialized HR technology providers, offering basic HR technology systems and HR technology outsourcing to employers of all sizes and HR professionals around the world. One of the important trends is the transition from local systems to cloud-based platforms and solutions (Software as a Service – SaaS). These changes provide increased flexibility, scalability and cost savings. Moreover, digital transformation is not just a modern trend among large corporations. Small and medium-sized enterprises are also mastering digital transformation,

digitizing their HR functions to remain competitive in the modern business environment [6].

Digital technologies can be used starting from the stage of searching and hiring a candidate (for example, an artificial intelligence chatbot, blockchain) to publish vacancies, check the candidate's profile, conduct interviews, etc. Artificial intelligence technology can save costs and use historical data to quickly and accurately search and view the profiles of potential candidates. Blockchain technology makes it possible to exchange information about vacancies and ensures confidentiality. Based on the use of digital platforms, an enterprise can carry out digital training, including creating a knowledge base using artificial intelligence, tracking the degree of personnel training needs, organizing the training process and feedback on the results using artificial intelligence, metaverse and other advanced technologies.

In addition, with the help of digital technologies, an enterprise can automatically calculate salaries and bonuses, track employees' completion of advanced training programs, manage skills and competencies, select specialists according to specified parameters for the implementation of certain projects, etc. [1]. At the same time, the advantage of advanced technologies used in digital human capital management is the absence of problems related to issues of discrimination, fairness, information confidentiality and other parameters that cannot be avoided under subjective assessment conditions.

Currently, many domestic and foreign companies are already actively implementing modern human capital management technologies in their work. According to a study by Deloitte, 56% of surveyed companies are currently restructuring their HR programs and policies to be able to use digital and mobile tools, and 33% are already using one form or another of artificial intelligence in their HR strategies [11]. Thus, the transition to a digital paradigm of human capital management helps modern companies more effectively and consistently optimize human resources using social, mobile, analytical, cloud and other technologies.

#### **4 Ethical Aspects of the Issue of Implementing Digital Technologies in HCM**

However, when actively implementing digital technologies in HCM, companies must also consider the ethical aspects of this issue and adopt a human-centric approach. Transparency, fairness and accountability are crucial to ensuring the effectiveness of digital human capital management technologies. In particular, human oversight and intervention are needed to verify recommendations and decisions generated by AI. Moreover, companies should prioritize employee well-being and ensure that AI technologies enhance, rather than replace, human interaction. A

focus on empathy, ethics and inclusivity will be vital in creating a harmonious balance between AI and human-driven HCM software in the future [10].

Along with the need to implement digital technologies, which in leading companies, as already noted, already almost completely manage the talents and teamwork of the enterprise, the digital transformation of human capital management requires the involvement of a new type of managers with a new way of thinking, who help strengthen and develop innovative teams, introduce new functions, thanks to which employees become more involved in processes, and teams work together more effectively.

In the long term, the quality of the workforce will increase along with the level and quality of education. This will lead to a significant decrease in standardized jobs with low skill requirements, as well as an increase in the volume of tasks requiring a high level of skill, increasing the complexity of many job profiles. Industry 4.0 requires that human capital be supported by continuous learning and the use of education systems that are more focused on knowledge. It is not only about education in companies, according to foreign scientists [2], effective integration of Industry 4.0 requires the study and development of human capital from the very beginning. Not only higher education plays a decisive role here, but also the right preschool, primary, secondary or vocational education. The introduction of the modern HCM concept in companies changes the overall approach to its management. For enterprises to be competitive today, it is not enough to simply implement progressive methods in people management. These methods must also be connected to the elements of Industry 4.0, which involves modern information systems (IS), digitization, the Internet of Things, advanced data analytics, etc. Only when technologies, the latest technological achievements and innovations gradually turn from external factors into internal ones, only then will companies be able to effectively use them for the benefit of achieving their overall efficiency and future competitiveness.

The capabilities inherent in digital technologies allow a company to respond very quickly to changes occurring in the external and internal environment. For example, data analysis can help companies identify areas of activity in which employee engagement is low, which allows them to develop targeted initiatives to address this problem in a timely manner. At the same time, using data analysis, which calculates the forecast values of human resource losses, regulates the consistency of human capital management policies with the overall development strategy of the company, which ultimately helps it to adapt to changes faster and adapt, as well as make informed decisions regarding human resource management.

Adapting a company's business strategy to the conditions of rapid changes in the external environment requires the search and implementation of new digital

models and human capital management tools, the key purpose of which is to form the interconnections of all HR stages and processes. Having learned to accumulate and analyze important personnel data using digital technologies, company managers will be able to quickly and effectively use them in decision-making processes, tying these decisions to logical reasoning, rather than to observations or intuitive actions.

## 5 Conclusions

The study of the impact of new technologies on improving labor efficiency made it possible to come to a generalized conclusion: the latest technologies for human capital management are invaluable for any company that seeks to remain competitive in a rapidly changing economic environment. A human capital management system based on the latest technologies contributes to the achievement of the following key effects: improving the process of retaining talented employees; optimizing production processes; increasing labor efficiency; saving costs; better employee engagement; more complete compliance with regulatory and legislative requirements; greater scalability; ensuring business agility; encouraging and recognizing employees; expanded analytics capabilities; more effective talent management.

The introduction of new technologies in human capital management brings such positive results as acceleration and facilitation of work and business processes, reduction of the risk of accidents at work, increase of competitiveness of business entities in the market, improvement of quality of goods and services, etc. By automating and digitalizing certain frequently repeated and routine HR processes, such as selection, adaptation and performance management, companies can free up valuable time and save significant resources. This enables HR professionals to focus on more important strategic initiatives, in particular, creating effective strategies for talent retention and maximizing the potential of human capital, which will contribute to achieving greater efficiency, employee satisfaction and productivity. HR teams using HCM systems can take advantage of digital technologies and provide better working conditions for employees. As a result, employee satisfaction increases and the pace of innovation in the enterprise accelerates.

By giving employees access to modern, technology-based human capital management tools (such as artificial intelligence, mobile applications, virtual reality training programs, etc.), companies increase corporate human capital, create more engaged and effective teams. This helps improve morale, reduce turnover, shorten administrative process cycles, increase productivity, and ultimately affects the company's profit and competitiveness. The implementation of HR technologies allows companies to easily centralize and comprehensively analyze

data about their employees, making it visible and accessible, eliminating the need for multiple systems or spreadsheets. This streamlined approach simplifies administrative responsibilities such as adaptation control, payroll management, performance evaluation, etc. This leads to increased accuracy and efficiency of all human capital management

functions, which is especially important in today's hybrid workplaces. In addition, by collecting and analyzing data on employee competencies, behavior, productivity, and engagement, companies can obtain valuable information that serves as the basis for improving human capital management strategies and enterprise development policies.

### References:

- [1] Azmuk, N., Grishnova, O., & Kuklin, O. (2020). Digital Employment: Ukraine's Ranking in the Global Division of Digital Labour. *Financial and Credit Activity Problems of Theory and Practice*, 2(43), 380–391. <https://doi.org/10.55643/fcaptp.2.43.2022.3578>
- [2] Bayraktar, O., Atac, C. (2018). The Effects of Industry 4.0 on Human Resources Management. In: Y. Ertugrul, C. Hamza, *Globalization, Institutions and Socio-Economic Performance*. Berlin: Peter Lang GmbH, 337–360.
- [3] Bhuwaneshwari, R., Udagi, K., & Huggi, M. M. (2023). Transforming human resource management in the digital era: Trends, challenges, and strategic implications. *ShodhKosh: Journal of Visual and Performing Arts*, 4(2). <https://doi.org/10.29121/shodhkosh.v4.i2.2023.4494>
- [4] D'Souza, M. C., & Paiithannkar, M. (2022). The impact of artificial intelligence (AI) on the transformation of recruitment processes. *International Journal of Electrical and Electronics Engineering Trends*, 9(2), July–December, 188–194. <https://ijoeete.com/wp-content/uploads/2024/09/29-max-d.pdf>
- [5] Heavin C., Power DJ. (2018). Challenges for digital transformation—towards a conceptual decision support guide for managers. *Journal of Decision Systems*, 27(1), 38–45. DOI: <https://doi.org/10.1080/12460125.2018.1468697>
- [6] Jacqueline Gwee (2023). Unlocking the Power of Human Resources Technology for Effective Human Capital Management. *Advantage Consulting*. <https://www.aadvantage-consulting.sg/post/human-resources-technology-for-effective-human-capital-management>
- [7] Kalenyuk, I., Grishnova, O., Tsybal, L., Djakona, A., & Panchenko, E. (2020). Formation of intellectual corporate capital: methods and modern trends. *Bulletin the National academy of sciences of the Republic of Kazakhstan*, 1(383), 182–191. <https://doi.org/10.32014/2020.2518-1467.23>
- [8] Kalenyuk, I. (et al.). (2020). Intellectual component of global leadership. *Management Theory and Studies for Rural Business and Infrastructure Development*, 42.4, 476–485.
- [9] Kovács, G., & Török, L. (2023). Industry 4.0, digital transformation and human resource management: Emerging themes and research trends in the context of the Visegrad countries. *Oeconomia Copernicana*, 14(4), 1651–1678. <https://doi.org/10.24136/oc.2023.049>
- [10] Nandinee Biswas (2023). How AI in HCM Will Impact the Future of Human Capital Management. *Centra Technologies USA*. <https://www.centrahubcrm.com/blogs/ai-in-hcm-revolutionizing-human-capital-management>
- [11] O'Connor, S. W. (2020). What is Digital HR? How Technology is Changing the Field. Northeastern University. <https://graduate.northeastern.edu/resources/what-is-digital-hr/>
- [12] Rinaily Bonifacio (2023). Leveraging Human Capital Management for Business Innovation. <https://www.shiftbase.com/glossary/human-capital-management>
- [13] Zhang, J., Chen, Z. (2023). Exploring Human Resource Management Digital Transformation in the Digital Age. *J Knowl Econ*, 1–17. <https://doi.org/10.1007/s13132-023-01214-y>

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