Digital design in the HRM system as a component of the sustainable development strategy

Olga Fokina, Larisa Goncharenko, Tatyana Sobol, Angela Mottaeva, and Asiat Mottaeva

1 Vyatka State University, Moskovskaya str., 36, Kirov, 610000, Russia
2 Moscow Witte University, 2nd Kozhukhovsky passage,12, Moscow, 115432, Russia
3 Moscow Polytechnic University, B. Semenovskaya street, 38, Moscow, 107023, Russia
4 Moscow State University of Civil Engineering, Yaroslavskoe shosse, 26, Moscow, 129337, Russia

Abstract. The article is devoted to digital design in the human resource management system and its role in the implementation of the organization’s sustainable development strategy. Digitalization of the Russian economy in the field of human resource management is becoming increasingly popular, opening up broad prospects for the economic growth of enterprises and stimulating competition in the market. In turn, the focus on digital transformation of the HRM system is reflected in the strategic management of the enterprise. The purpose of the work is to analyze digital design in the HRM system as a component of the strategic management process in the light of the sustainable development of the organization. A systematic approach was chosen as the leading approach to the research, considering the process of digital transformation as a complex and, at the same time, holistic phenomenon included in the organization’s management system. During the research, an analysis of the dynamics of digital transformation implemented in the form of projects in the field of HRM was carried out, trends in the digitalization of personnel management processes were identified, segments of digital design in the HRM system were identified, the main suppliers of digital design solutions were indicated, drivers and problems of digitalization of HRM systems were noted, and the role of digitalization of the HRM system in the sustainable development strategy.

1 Introduction

Digitalization of the Russian economy in the field of human resource management, being one of the stages in the development of the HRM sector, is becoming increasingly popular. Digitalization of the HRM system, implemented in the form of design solutions to provide the organization with qualified personnel, employee accounting, calculation of key performance indicators and wages, organization of career promotion, unification of personnel processes, allows creating a convenient working environment for employees, reducing the workload of HR specialists and managers, and in general use human resources

* Corresponding author: doptaganka@yandex.ru
more efficiently. In turn, the focus on digital transformation of the HRM system is reflected in the strategic management of the enterprise, contributing to more competent strategic decision-making, expanding the possibilities of using strategic planning tools, stimulating employees to form their innovative potential, and is gradually becoming part of a corporate strategy focused on sustainable development of the organization. At the same time, the competitive advantage of the enterprise becomes human resources and key competencies of personnel integrated into the overall digital ecosystem of the organization.

The need to use a project approach in the process of digitalization of enterprise systems, including HRM, and the decisive role of digital technologies in the development and implementation of a sustainable development strategy in the modern market space determines the relevance and purpose of this study—the analysis of digital design in the HRM system as a strategy for the sustainable development of an organization. Achieving this goal was achieved by solving problems of studying the digital market, innovative human resource management systems, segments and participants of the digital market, linking the digital design process to the corporate strategy of the organization, ensuring its sustainable development. The results of the study will be useful for further theoretical and empirical research into the process of digitalization of the personnel management system at enterprises in various industries and fields of activity.

Despite the active development of the digitalization process in various sectors of the national economy, digital design in the field of human resource management in the light of strategic management, as a topic of scientific research, has not yet become widespread due to its novelty and complexity of implementation in the activities of enterprises. In the Russian scientific space, the topic of digitalization of personnel management is covered in the works of [1-7] and others by B.B. Slavin considers HRM-class information systems as platform solutions for creating labor ecosystems, substantiates the need for their use, and points out the requirements for information systems in the field of personnel management. I.V. Groshev and H. Manin, considering the design of a digital organization, note the impact of digitalization on the growth of involvement, productivity and, in general, on increasing the efficiency of the work activities of organization members. P.G. Gribov also draws conclusions about the need to take into account digital solutions when designing an organization, which makes it possible to increase the effectiveness of workforce planning, recruitment and promotion of personnel, communication systems, assessment, motivation and remuneration. E.V. Pogorelova and others, demonstrating an example of integrating a digital platform with a unified corporate automated labor management system, propose a new model of a quality management system for calving personnel. L.A. Ilyukhina and I.V. Bogatyreva, studying the tools and capabilities of digital recruiting, substantiate the need to introduce digital tools for regulated personnel selection, which allows, on the one hand, to reduce the organization’s time spent searching and evaluating candidates and, on the other hand, to save potential employees’ time in obtaining suitable jobs. The use of the project approach in the context of updating digital technologies is considered in the works of Kh.A. Magomerzaev, M.G. Mukhidinov and Kh.S. Abdulaev [8], O. Kolosova [9] and other authors.

The topic of digitalization of the HRM system is also discussed in the works of scientists from neighboring countries. I.S. Shamsov, noting the stage of development of digital technologies in the Republic of Tajikistan as initial, characterizes the state of the labor market and the system for training highly qualified personnel in the digital economy [10]. Sh.M. Avezova, describing the labor resource management system in Uzbekistan, notes certain features of the transformation process in the digital economy, such as more frequent changes in the sphere of professional activity of workers, reducing the “digital gap” in regional, age and gender aspects, updating previously formed competencies, substantiates the need to invest financial resources in the development of human capital.
S. Gulyamov, G. Karieva and M. Rasulova call the digitalization process a stimulating factor in the economic and social growth of the Republic of Uzbekistan, including in the field of labor resources [12]. E. Zhailauov, E. Abzalbek and B. Zhumanova, studying the dependence of production volumes on the cost of innovation and digitalization of the industrial sector of the Republic of Kazakhstan, also draw conclusions about the impact of digitalization on the personnel training system [13].

Issues of digital design of an HRM system are more widely discussed in the works of scientists from far abroad [14, 15, 16, 17, 18, 19], etc. For example, the relationship between digital transformation, human capital development and the problem of using natural resources using the example of several countries at once - China, Brazil, India, Turkey, Russia, Mexico and Indonesia - considered by H. Liang, C. Shi, N. Abid and Y. Yu. The authors argue that digital transformation determines the development of human potential and, accordingly, the short-term and long-term economic growth of countries [20].

The role of digital technologies in human resource management in terms of personnel selection, training and development is noted in the work of K. Milosevic, I. Katic and N. Tasic. It is argued that E-HR can improve the transparency, accuracy and accessibility of an organization’s personnel data [21]. G.I. Tanco, J.-M. Plan, D. John and Kabongo note the impact of digitalization of human resource management on improving organizational performance [22]. A. M. Amor talks about accelerating the pace of digitalization of personnel management processes and the introduction of digital personnel transformation in various types of activities, compares digital recruitment with the traditional model, paying special attention to the candidate tracking system [23]. D. Martins substantiates the importance of creating a center specializing in digital human resource management, which is a single platform for the interaction of several agents and contributes to the development of new ideas, tools for managing sources, information and knowledge [24]. S.R. Mondal and S. Das conduct a study of the digitalization process in the field of human resource management with a focus on new sustainable development [25]. Petersen N., H., Furest S., Torkkeli L. study digitalization with reference to sustainable business management [26]. More and more researchers are drawing attention to the strategic importance of the process of digitalization of the human resources management system, noting that digital transformation has a certain impact on the adaptation of employees to new operating conditions, which determines the need to harmonize digital strategy and human capital [27, 28].

A study of publications by Russian and foreign authors on the research topic revealed the need to substantiate and more deeply consider the significance of the digital transformation of the HRM segment in the corporate governance system. This issue is only indirectly reflected in the works of R. Yankovsky, who considers the introduction of information technologies into the practice of corporate governance [29], Mujib A.V. and Setijono V.P., establishing a connection between corporate governance and personnel performance [30], A. Monica-Violeta, V-L. Vaidean, A.L. Popa, who consider the connection between the process of digitalization and corporate governance [31], Turkmen I., who substantiates the need to comply with ethical principles and corporate digital responsibility in the process of digitalization [32] and other authors. Thus, it is of interest to study the issues of digital design of an HRM system, which plays a decisive role in developing a behavioral strategy focused on the sustainable development of an organization.

2 Materials and methods
The methodological basis of the study is based on the application of general and general scientific research methods. Analysis, synthesis, generalization, classification, and modeling, as general scientific methods, made it possible to study the dynamics of the development of project activities in the field of digital transformation of the human resource management system, identify segments of the totality of digital projects in the HRM system, indicate the main drivers, problems of development of project activities in the field of digital transformation of HRM systems. Description and formalization as general scientific research methods made it possible to characterize the development features of the market for digital HR technologies, the main suppliers of digital design solutions in HRM systems, and to schematically represent the role of digital design of an HRM system in the corporate management strategy focused on the sustainable development of the organization.

3 Results

The digital market for human resource management is relatively young, not only on a Russian, but also on a global scale, and is characterized by high growth rates. Back in 2008, AMR Research noted that the global market for HRM systems was growing more than twice as fast as the market for industrial applications. Over the period 2008–2022, the average annual growth rate of the market, according to various estimates, ranged from 8% to 11%. Starting in 2023, according to Grand View Research forecasts, the growth of the global HR systems market will grow by an average of 12.8% annually and will reach $56.15 billion by 2030 [33].

In Russia, increased attention to the implementation of digital HRM systems was observed at the end of the first decade of the twentieth century, which is associated, first of all, with the understanding that the implementation of these design solutions has a significant impact on increasing the efficiency of personnel. The development of outsourcing in the field of personnel management and increased demand from large businesses had a certain impact. Estimating the volume of the Russian market causes certain difficulties for a number of reasons. Firstly, these functions are the functionality of many accounting and other accounting programs. Secondly, there are separate products for the activities of individual personnel services, which are developed only according to customer requirements. Thirdly, it is quite difficult to isolate the HRM component from ERP projects, which include not only personnel management, but also logistics, accounting, finance, purchasing and sales, inventory management, etc. As a result, assessments given to the Russian digital HRM market are quite contradictory. Figure 1 shows data from the business information and analytical portal TAdviser, which generates its own estimates based on open information from various sources.
According to TAdviser, the Russian market for HRM systems in 2022, including HCM systems aimed at managing human capital, individual tools for automating assessment, selection, personnel development, as well as services for the design, implementation and support of such systems, compared to 2008 increased almost 4 times in a year, showing dynamic growth, with the exception of the period 2013–2016, when the market was fixed at volumes of about 15–16 billion rubles. This market stagnation is due to the following. First of all, this is the exhausted potential of extensive development, realized in the form of the implementation of software for personnel records and payroll. Based on the results of 2013, such systems were already used by 100% of companies in the large business segment and about 80% in the medium business segment. In small businesses, a payroll system has been implemented in more than 30% of organizations. In addition, the intensive development of the market was limited by the lack of demand for existing “heavy” HRM systems, characterized by redundant functionality and high prices, and cloud services had not yet received proper development by that time. Therefore, only in 2017 there was some market revival (+7.9%), which entered the stage of active development up to 12–13% in 2020 and 2021. In 2022, growth was 10.2% and the growth rate is projected to continue in 2023. The active introduction of digital technologies in the field of HRM is confirmed by the results of a comparison of the total number of organizations in the Russian Federation for the period 2010–2022 and the number of organizations implementing projects to use the Internet (Figure 2).
The number of organizations implementing projects to use the Internet in the field of HRM.

Compiled by the authors [31, 32, 34]

With a decrease in the total number of organizations from 4823.3 thousand units in 2010 to 3285.1 thousand units in 2022 (−32.5%), the number of organizations implementing projects to use the Internet for professional training of personnel increased from 1403.6 thousand units up to 1609.7 thousand units (+30.7%), and for hiring personnel from 1003.2 thousand units up to 1185.9 thousand units (+21.2%). At the same time, the highest growth rates were observed in 2015: 1.37 for organizations implementing projects on using the Internet for professional training of personnel and 1.16 for organizations implementing projects on using the Internet for hiring personnel. This is largely due to the emergence of an anti-crisis plan of the Russian government, prepared “in order to ensure sustainable economic development and social stability during the period of the strongest influence of unfavorable foreign economic and foreign policy conditions” [45]. Along with other programs, the plan provided for the development of import substitution projects, which is a driver for the development of the digital economy, including in the field of HRM. The volume of gross domestic costs for the development of the digital economy in 2021 amounted to 4848 billion rubles (compared to 3324 billion rubles in 2017), the volume of internal costs of organizations for the creation, distribution and use of digital technologies and related products and services amounted to 2947 billion rubles (1,739 billion rubles in 2017). The government’s efforts to digitalize sectors of the economy have yielded the expected results, where the HRM sector has also received digital development: the share of organizations implementing projects to use the Internet for professional training of personnel increased in 2022 to 49.0% (29.1% in 2010 and 39.7% in 2017); for hiring staff up to 36.1% (20.8% and 29.0%, respectively, in 2010 and 2017) – see Figure 3.
Currently, there are four main trends in the digitalization of personnel management processes, which have already entered the life of human resources services and are undergoing further development: firstly, the inclusion of artificial intelligence technologies in the HR management system, and secondly, the collection, storage and processing of large amounts of data using cloud services, thirdly, the use of chatbots for internal and external communications, and fourthly, virtual and augmented reality technologies used for training and personnel assessment [46]. Increasingly, organizations are using special software to solve specific problems. Currently these are the systems Kontur.Personnel, AppRaise, Skillas.Selection, MyTeam, Amber HRMS and others. At the same time, the degree of implementation of these design solutions for sectors of the national economy is different - see Figure 4.

Compiled by the authors [31, 32, 34]
Fig. 4. Implementation of projects on the use of special software in personnel management information systems in the context of foreign economic activity sectors: 2022. Compiled by the authors [31, 32, 34].

As we see, the number of organizations equipped with special software in HRIS systems, that is, personnel management information systems, does not depend on the total number of organizations in the foreign trade sectors of Russia. Such programs are most actively used in the field of information and communications (13.6% of organizations), wholesale and retail trade (12.7%), the financial sector (12.5%) and the higher education system (8.0%). The areas of culture and sports (1.1% of organizations), public administration and social security (1.4%), real estate transactions (1.8%), water supply, sanitation and waste disposal (2.1%), energy provision (2.2%), health and social services (2.2%), agriculture (2.2%) and professional, scientific and technical activities (2.5%).

Digital projects in the HRM system are classified into several segments:
- “Core HR” – systems designed for organizational management, personnel records, payroll;
- “Talent Management” for employee selection, adaptation, motivation, training and development;
- “Experience Management” to manage employee engagement, experience, and life cycle;
- “Analytics and Planning” for analytics and planning in the process of human resources management;
- “Portal and Workplace” for creating corporate portals and organizing the work environment.

The largest providers of digital solutions in these segments as of 2022 are shown in the table.

Table 1. Top 15 largest providers of digital design solutions in HRM systems: 2022.

| #  | Company          | Supplier  | Revenue from HR projects in Russia, million rubles. VAT included | Main market segment HRM | The largest customers of HRM projects in Russia
|----|------------------|-----------|---------------------------------------------------------------|--------------------------|--------------------------------------------------|
| 1  | Mirapolis        | Vendor    | 739                                                            | Core HR                  | Russian Post, Russian Railways, Government of Moscow, Gazprom, Inter RAO, TMK
| 2  | Molga Consulting | Integrator| 636                                                            | Talent Management        | Sberbank, Bank Otkritie, Lukoil, Technologies Alpha bank, Sibur
| 3  | Potok            | Vendor    | 630                                                            | Talent Management        | n/d
| 4  | Websoft          | Vendor    | 536                                                            | Talent Management        | Magnit, Rosneft, MOESK, Transneft, Rostelecom
| 5  | Equio            | Vendor    | 514                                                            | Talent Management        | n/d
| 6  | Huntflow         | Vendor    | 423                                                            | Talent Management        | n/d
| 7  | Timebook         | Vendor    | 405                                                            | Analytics and Planning   | n/d
| 8  | Skillaz          | Vendor    | 402                                                            | Talent Management        | n/d
| 9  | HRLink           | Vendor    | 358                                                            | Core HR                  | n/d
| 10 | Knomary          | Vendor    | 342                                                            | Talent Management        | EVRAZ, Cherkizovo, Pepsico, RusGidro, UMMC
| 11 | CGKorus Consulting| Integrator| 325                                                            | Portal and Workplace     | "Газпром Интернешнл Лимитед", "БФТ Холдинг", "ТрансЛом", "Аль
<table>
<thead>
<tr>
<th>No.</th>
<th>Vendor</th>
<th>Revenue Increase (%)</th>
<th>Experience Management</th>
<th>Talent Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mirapolis</td>
<td>14.7%</td>
<td>3.2%</td>
<td>n/d</td>
</tr>
<tr>
<td>2</td>
<td>Molga Consulting</td>
<td>33.2%</td>
<td>3.3%</td>
<td>n/d</td>
</tr>
<tr>
<td>3</td>
<td>Potok</td>
<td>40.0%</td>
<td>3.4%</td>
<td>n/d</td>
</tr>
<tr>
<td>4</td>
<td>Websoft</td>
<td>0.2%</td>
<td>3.5%</td>
<td>n/d</td>
</tr>
<tr>
<td>5</td>
<td>Equio</td>
<td>37.1%</td>
<td>3.6%</td>
<td>n/d</td>
</tr>
</tbody>
</table>

Most suppliers are vendors with positive revenue dynamics in recent years. Mirapolis maintained its leadership in 2022, increasing revenue by almost 15% compared to 2021. The top five also included Molga Consulting (+33.2%), Potok (+40.0%), Websoft (+0.2%), and Equio (+37.1%).

Given the loss of highly qualified employees after the start of the SVO and partial mobilization, accompanied by the lack of familiar information systems and cloud services from foreign suppliers, large Russian customers have demonstrated interest in domestic HR products. Focusing on reducing costs, enterprises turned their attention to more affordable and functionally suitable products, which ensured business growth for domestic manufacturers. The most popular services were the implementation, support and development of services for corporate training, personnel adaptation, HR analytics, and corporate portals. At the same time, there is a developing trend in the development of projects aimed at combining the means of digitalization of HRM systems and turning them into a single ecosystem, including the entire cycle of human resources management, starting from selection and hiring of personnel to employee assessment, building educational trajectories and areas of growth.

Other trends include market consolidation, import substitution, growing enterprise demand for integrated solutions, growth in the electronic HR document management segment, increased attention to the human factor, focusing efforts on retaining existing employees, increasing their productivity and improving experience.

Compiled by the authors [34]

The main drivers for the development of project activities in the field of digital transformation of HRM systems are:
1) withdrawal of foreign suppliers from the Russian market and the release of a wide niche for Russian manufacturers;
2) increasing requirements for the functionality and design of HRM systems;
3) government requirements for government organizations to replace foreign software with Russian ones;
4) development of Russian legislation in the field of personnel policy;
5) more active use of digital tools for personnel search in conditions of the demographic crisis.

At the same time, there are a number of serious problems that complicate the further digitalization of HRM systems:
1) the insufficiently serious attitude of a number of managers to the role of personnel services in the activities of the enterprise;
2) the presence in organizations of working software solutions from foreign manufacturers;
3) The lower competitiveness of domestic products compared to foreign ones, associated with insufficient functionality of systems, weak information security and protection of personal data;

4) The need for changes in corporate culture and work processes accompanying the transition to domestic systems;

5) The need to form partner ecosystems and their software products;

6) Lack of uniform standards for HR information products for the industry.

According to a preliminary estimate by TAdviser, the volume of the HR-tech market in Russia in 2024 will reach 32.1 billion rubles. The expert forecast of growth rates for 2024 is quite ambiguous: from 9% (Potok) to 30% (Knorus-Consulting). On average, the forecast growth rate is about 17%. At the same time, rapid development of HR electronic document management services, employee personnel track management systems and artificial intelligence is expected, as well as a concentration of the market for developers of HRM products.

Active digitalization of enterprise management systems, including HRM, could not but influence the formation of a corporate management strategy, one of the main goals of which is to ensure sustainable development. In this regard, the role of digitalization of the HRM system in the organization is increasing, on the one hand, as an object of investment in the development of human resources, and, consequently, in the development of the organization as a whole, and, on the other hand, as a source of market sustainability and competitiveness of the organization - see figure 5.

Fig. 5. The role of digitalization of the HRM system in the corporate management strategy with a focus on the sustainable development of the organization.

Compiled by the authors

Innovative changes in the HRM system have an impact on the most important components of the organization's corporate strategy. In the field of management and distribution of resources, the organization’s personnel, being the most valuable resource,
have the opportunity to choose the directions and methods of spending material, financial, and information resources in the most significant business areas. The development and implementation of business strategies focused on the sustainable development of the organization takes on new forms and reaches a higher level of competitiveness thanks to the introduction of digital technologies into the activities of employees involved in these processes. Building and managing organizational structures with the employees who are part of these structures also becomes more effective thanks to the digital modernization of workforce efforts. Thus, digitalization of the HRM system in modern conditions is becoming not just a tool for organizing the activities of enterprise personnel, but also part of the corporate strategy for managing the enterprise as a whole.

4 Discussion

The main provisions of this study are that the digital transformation of the HRM system influences the corporate governance strategy, being currently one of its leading components in the light of the sustainable development of the organization. The content of the article makes a certain contribution to the discussion regarding the place and role of digital design of an HRM system in corporate strategy. This is due, firstly, to insufficient elaboration of issues of design activities in the field of digitalization of HRM and, secondly, to the lack of a clear link between the results of digital design of the HRM system and the competitive position of the organization in the market. The issues presented in the article provide some scope for discussion, including opportunities for future research.

Digitalization of HRM systems, which contributes to a more complete disclosure of the human potential and competencies of personnel, is increasingly considered as one of the main elements of strategic management, making it possible to solve strategic problems of sustainable development and forming a real competitive advantage of the organization. The rapid development of digital technologies, which has affected the management sector, places new demands on the management system, including, among other things, personnel management. HR decision-making is increasingly driven by digital solutions. The digital approach to personnel management, implemented through innovative projects, makes it possible to implement the main directions of personnel policy with greater impact, ensuring the success of the organization in the market, taking into account the requirements imposed by modern times on its social and environmental significance.

5 Conclusion

The study revealed that the digitalization of HRM systems is increasingly considered as one of the main elements of strategic management, making it possible to solve the most important strategic tasks and forming a real competitive advantage of the organization. The dynamic growth in the number of organizations implementing projects for the implementation and use of digital technologies in the HRM system, the increase in the number of suppliers of digital design solutions in the context of the implemented import substitution policy indicate further prospects for the development of digitalization in the field of human resource management. Studying the dynamics and trends in the development of digital projects in the HRM system, the market for digital design solutions, and determining the role of digitalization of the personnel management system in the organization’s sustainable development strategy allowed us to achieve the goal of this study - to analyze and confirm the hypothesis of digital design in the HRM system as an element of the organization’s sustainable development strategy.
References

Gulyamov, G.I., Systems postpandemic era. https://doi.org/10.56726/IRJMETS42517


H. T. A. Shouraki

Kaur, K., DOI: 10.1051/e3sconf/202338102010

Alhadrawi, K., https://doi.org/10.1051/e3sconf/202338102011

A. Issayeva et al., E3S Web of Conferences 03040

Gulyamov, K. problems of socio economic systems in the context of globalization. DOI: 10.1051/e3sconf/202338102015


Shamsov, I.S. (2020) Tajikistan: economics and management of agrobiotechnologies. DOI: 10.55267/iadt.07.14010


Ganebnykh, A., Slavin, B.B. (2023) Innovation and investment. DOI: 10.1051/e3sconf/202338102016


Yuan Liang, Milošević, N.Katić, S. Tasić Accelerated digitalization of human resources in the postpandemic era. Conference: 244: John. Plane, Economic systems in the context of globalization. DOI: 10.1051/e3sconf/202124411025

vankevich, A., Sing, K., Kettler, J. and Groshev, I.V. (2023) Problems of economics and legal practice. DOI: 10.1051/e3sconf/202338903040

Khussainova et al., E3S Web of Conferences 03040


Yuan Liang, Milošević, N.Katić, S. Tasić Accelerated digitalization of human resources in the postpandemic era. Conference: 244: John. Plane, Economic systems in the context of globalization. DOI: 10.1051/e3sconf/202124411025

vankevich, A., Sing, K., Kettler, J. and Groshev, I.V. (2023) Problems of economics and legal practice. DOI: 10.1051/e3sconf/202338903040

Khussainova et al., E3S Web of Conferences 03040


