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DEVELOPING STRATEGIES FOR DIGITAL HUMAN RESOURCE MANAGEMENT IN BUSINESS ORGANIZATIONS *

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Abstract. The present research is dedicated to the good practices of using artificial intelligence (AI) in the overall process of digitalization of higher education. The major objective is to identify good practices used so far by the universities in implementation of AI technologies in their everyday life for educational and administrative needs. At the same time, our additional goal is to understand the expectation of students for further implementation of AI in universities. We developed our research in 2 main stages: first one – collection and identification of good practices of universities with AI and digitalization and second one – dedicated to students' expectations. We conducted 25 interviews with representatives of 18 Bulgarian universities, responsible for digitalization. Second one was to provide survey among students (n=254). Our findings reveal that digitalization is defined as one of the leading priorities for universities; the major part of universities have specific strategic document devoted to digitalization. Several challenges are outlined for the smooth digitalization: lack of sufficient resources (including financial, administrative capacity etc.); unwell prepared infrastructure (including lack of common vision for the different systems used so far within the university); emergence of various types of resistance (both in academic and administrative staff) etc. Big advantage for universities using AI is seen in improved quality of the educational process (including introduction of new educational perspectives through new technologies), improved administrative service, improved public image which is considered to reflect to increased number of potential candidates.

Keywords: digitalization; human resource management (HRM); digital transformation; digital competences; change management; AI

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JEL Classifications: M12, M15, O33, J24

1. Introduction

Modern business world is inevitably connected and even more precisely – based on digitalization and the development of new technologies. Digitalization covers more and more spheres around us – both of personal and business life – from different forms of communication (social media, chats, platforms) to complex process of data-driven analysis, modeling and forecasting. Digital services are much faster, more reliable, and tailored to consumer current desires and new trends.

Digitization in general can be seen as support from both sides - both from the organization and the employees responsible for the implementation of these processes, as well as from the recipients of digitized services. From an organizational point of view - digital processes, as already mentioned, are faster, more reliable, which leads to improved organizational efficiency (direct optimization of at least the time and human resources re-

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quired for the implementation of the respective process). From the point of view of the respective employee - the digitized process provides much greater opportunities for preventing technical errors, monitoring deadlines, traceability of actions and, respectively, of inactions, etc. At the same time, from the perspective of the recipient of the digital service, the service is delivered quickly and objectively. The digital service maintains consistent quality and speed, regardless of user's characteristics such as age, sex, financial and social status, gender, religion etc.

Similarly, all human resource management processes align with mainstream practices. At present, digitalization in Human Resources Management could be argued to be relatively widely used in certain processes - such as in the recruitment, but also quite limited in others - such as in employee training and development. At the same time, some imperfections are also observed in the introduction of human resources digitalization, some of which have a more general organizational context, while others are more specific to human resources management. For example, companies often use different systems for various purpose, yet these systems frequently fail to share data with one another. This force employee to enter the same information multiple times across systems, designed for different purposes, making the process inefficient. There are also still organizations that duplicate the digital process with the traditional one, which, on the one hand, does not allow the electronic system to be used to its full extent, while at the same time largely negates the existence of the electronic system at all, since they significantly reduce its efficiency. For example, in many organizations, the organizational culture still requires the submission of a paper leave application, even though the current system used in the same organization for human resources management supports electronic submission.

All of this highlights the need for a holistic approach by senior management to digitalization in human resource management. This article provides just such solutions.

2. Literature review

In recent decades, digitalization has penetrated a wide range of areas of human life - from personal to professional. Human resource management (HRM) is no exception. In this sense, the lively interest of scientific discourse in this specific field of knowledge is quite logical. It should be commented here that during and after the Covid-19 pandemic, digital tools have gained much greater importance and, therefore, much greater interest from a scientific point of view.

According to research of Ulatowska, Wainio and Pierzchała (2023), a great percentage of HRM personnel reported that the organizations they are employed by have adopted digital innovations. The digital innovations include chatbots, dashboards, application software systems, a virtual HRM assistant, and various digital tools (ibid). Schmid et al. (2024) consider that digital transformation alters job functions, introducing new challenges for workforce development and employee careers. In this scenario, the encouragement of creativity via flexible working approaches offers a significant opportunity.

One of the important aspects from organizational digitalization and digital HRM is the change in the leadership. Cheng, Jin and Kwak (2025) admit that digital leadership is crucial in improving organizational sustainability, both directly and indirectly, by fostering digital capabilities and promoting a digital organizational culture. Rialti and Filieri (2024) explore agile leadership in digitalization process of company. They consider that agile leaders facilitate effective digital transformation by implementing rapid decision-making processes, actively engaging in digital initiatives, and adopting both incremental and groundbreaking practices, which contribute to a more streamlined and efficient organization (ibid). Wang, Mansor and Leong (2024) claim that effective digital leadership enhances employees' digital performance by promoting engaged human resource management practices and strengthening their dynamic capabilities.

The impact, that digital practice has on employees and overall performance of enterprise is explored by Zhang et al. (2024). They admit that digital HRM has important role in shaping digital transformation, innovative work behavior, and overall productivity. In this line comes the research of Ogbeibu et al. (2021) who explore the relation between creativity of teams and smart HRM technologies.

Considering the rapid development with which AI is entering professional life, it is quite logical for scientists to be interested in this direction, especially in the field of HRM. Gupta, Lakhera and Sharma (2024) admit that AI and digital transformation are transforming human resource management practices in multiple sectors. Using AI in recruitment process and its impact on the attractiveness of the organization is the focus on the research, presented by Tursunbayeva et al. (2025). Aguinis, Beltran and Cope (2024) explore how AI, especially ChatGPT could be transformed to a helpful HR assistant. Dimcheva and Stoyanov (2023) assess the role of AI in decision-making process through the managers perceptions. At the same time, Stone, Lukaszewski and Johnson (2024) claim that AI is transforming and will keep transforming how organizations draw in skilled candidates, recruit competent staff, train employees, oversee their performance, and establish compensation and incentive structures. Chowdhury et al (2023) indicate that organizations should extend their focus beyond merely technical resources in adoption of AI in HRM. Authors pointed out that organizations should prioritize the enhancement of non-technical aspects, including human skills and competencies, leadership qualities, team coordination, organizational culture, an innovative mindset, governance strategies, and methods for integrating AI with employees, in order to fully leverage the advantages of AI adoption (ibid).

According to Prikshat et al. (2023), contemporary applications of artificial intelligence have augmented human resources functions. They admit that AI-augmented HRM has taken on a strategic role in achieving outcomes at both the HRM domain level and the organizational level, contributing to a sustainable competitive edge (ibid).

Interesting researches devoted especially for developing digital HRM strategies and future of HRM are proposed by Ruiz et al. (2024), Dabić et al. (2023); Fahey and Saint-Onge (2024). Do, Chu and Shipton (2025) explore AI driven HRM and employee behavior. The authors introduce a framework grounded in self-determination theory. This framework suggests that employee exploration serves as a mediator in the connections between AI-driven human resource management and employee outcomes. Furthermore, trust in artificial intelligence acts as a moderator for these relationships (ibid). Salvadorinho, Ferreira and Teixeira (2024) pay attention on the lean human resource 4.0 with special focus on the possibility of talent management in this organizational environment. Liu (2023) explores the HRM system, based on data mining technology which could be one of the possible future developments of these system. Manroop, Malik and Milner (2024) examine in depth the ethical aspects of using big data in HRM. Andrieux et al. (2024) also explore several important ethical aspects of using generative AI in HRM. Griep et al. (2024) pay attention on the sustainable HRM in a strategic dimension. They outline five key elements of this sustainable development of HRM, namely: long-term thinking; involving employees in decision making process, especially these that affect them; continuously learning and skill development of staff; employee care (which authors claim as very important aspect for achieving sustainable HRM) and organizational system and structure that are in line with the HRM principles. In this regard Mamun et al. (2024) consider the socially responsible HRM could achieve sustainable performance of the company.

At the same time, scholars are concerned about some aspects of comprehensive digitalization in managing human resources, especially connected to controversial practices such as using Algorithmic Management and Algorithmic control over employees. Lukaszewski and Stone (2024) examine the possibility if AI and machine learning (ML) could breach ethical norms. Scholars assess how AI and ML models influence perceptions regarding privacy invasion, biases and unjust discrimination in hiring processes, and the potential damage to individuals and organizations stemming from inaccurate data produced by AI and ML. They develop and propose strategies that organizations could implement to address these significant ethical challenges. Breidbach (2024) also admits that in spite of numerous advantages, algorithmic decision making carries an intrinsic downside that can lead to problems such as diminished privacy for individuals and an imbalance of power within society. Meijerink and Bondarouk (2023) consider that algorithmic input, processes, and outputs enable employers to exert control over employees, consequently reducing both job autonomy and the perceived value of work for these individuals. Scholars highlight that the nature of algorithmic management is complex and essentially - dual; while it restricts job autonomy and value, it also has the potential to enhance both for workers through HRM algorithms (ibid). Bujold, Parent-Rochelleau and Gaudet (2022) explore the opacity of using algorithmic management. Their findings indicate that the clarity of algorithmic surveillance

correlates positively with procedural justice, while the clarity of algorithmic performance management is positively associated with distributive justice. Several studies also could be pointed out in this line: Deng et al. (2024), Trautwein et al. (2025), Zhou, Wang and Chen (2023). Cheng and Hackett (2021) admit that although the algorithms used in Human Resource Management (HRM) are generally not rooted in robust theoretical frameworks, the term "black box," commonly used by critics to describe these algorithms, may not be entirely fitting. Rather, it is more accurate to define HRM-related algorithms as heuristic methods.

In Bulgarian context several interesting researches have to be outlined, when we consider HRM, digital development and change management. Kostev and Anguelov (2024) explore the perceptions of employees in public administration towards overall digital transformation in organizations. Ilieva, Anguelov and Nikolov (2019) propose a structured way in which an organization can become more agile and respond more quickly to change. At the same time research shows that sustainable human capital development and good working conditions increase employee engagement and highlight the need for wider implementation of digital solutions in human resources management (Anguelov, 2019).

3. Methodology of the research

This article in fact represents a final result from a two years lasting project, financed by the University of National and World Economy in Sofia, Bulgaria. During the implementation of the project, various tools were developed, through which primary information was collected from numerous representatives of stakeholders - employees in companies, HR managers and experts, senior management, business owners, in order to assess the different views and perspectives on attitudes, stereotypes and prejudices about the digitalization of processes and activities related to human resource management.

This study uses a mixed-method design, combining quantitative and qualitative methods, to provide both a broad range of data on organizations' attitudes and readiness for digitalization in human resource management, as well as a deeper understanding of the strategies and challenges they face.

The choice of a mixed research method was a logical solution, since the topic of digitalization in human resource management has both quantitative and highly qualitative dimensions. Information was needed that would show the general trends in attitudes towards digital solutions, but also a deeper understanding of the reasons behind these attitudes. Quantitative data provides clarity about the degree of readiness of organizations, the actual use of technologies and the existing barriers. Qualitative data, on the other hand, reveals how people perceive these changes, what fears or expectations they have and how the organizational environment influences the process. Therefore, in the project, both approaches were used in parallel, with the aim of achieving mutual complementarity and providing richer primary material necessary for the subsequent analysis and interpretation of the results.

The choice of a mixed research method was one of the logical options for a scientific approach and solution, since the topic of digitalization in human resource management has not only quantitative, but also highly qualitative dimensions. It was necessary to collect primary information that would show the general trends in attitudes towards digital solutions. At the same time, however, it was equally necessary to achieve a deeper understanding of the reasons behind these attitudes. Quantitative data provides clarity on the degree of readiness of organizations, the actual use of technologies and the existing barriers. Qualitative data, in turn, reveals how people perceive these changes, what fears or expectations they have and how the organizational environment influences the process. Therefore, the project used both approaches in parallel, purposefully using the synergistic effect of the mutual complementarity of these approaches. The different steps within the methodology is presented in Figure 1.

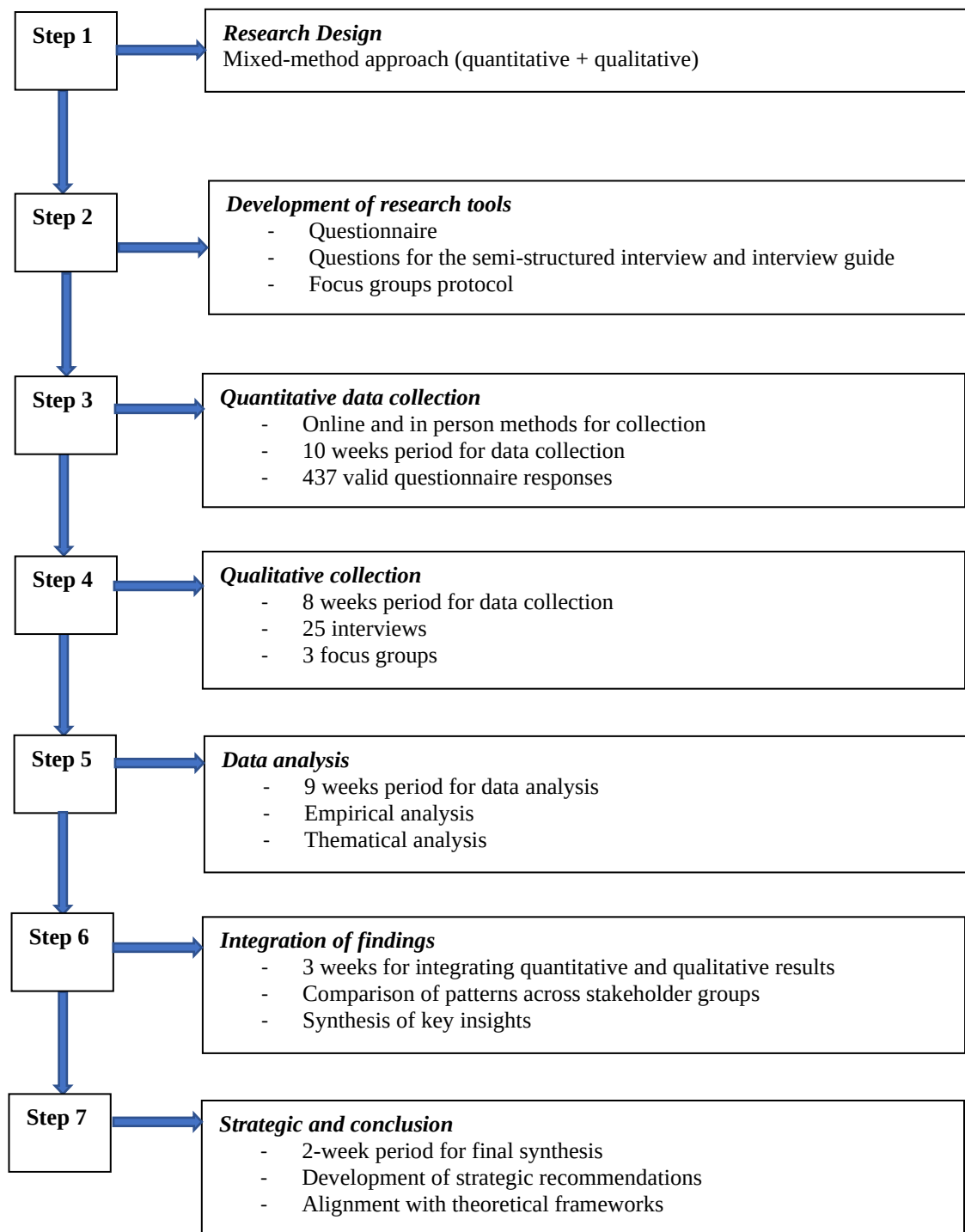


Figure 1. Complete research methodology: stages, instruments, and procedures

The quantitative part of the study collected 437 valid questionnaire responses. The sample included 257 employees, 113 HR specialists, 46 middle managers and 21 owners or representatives of senior management. The specially developed survey contained 42 questions, structured in five thematic blocks: level of digitalization, attitudes towards digital HR tools, perceived benefits and risks, competencies and training, organizational culture and readiness for change. The surveys were distributed both online and on paper to organizations from 12 different economic sectors, including services, trade, manufacturing, IT, healthcare and public administra-

tion. The sample included micro-, small, medium-sized and large enterprises, which allowed for the analysis of possible differences according to organizational scale.

To achieve the objectives of this study, we used several composite indices that were constructed by combining variables that are thematically related. These variables were assessed using a 5-point Likert scale. From this perspective: the index for the degree of digitalization of HR processes in a business organization consists of the following sub-elements, assessed by the degree of use of: electronic systems for selecting employees, automated administrative processes, etc. In turn, the index for attitudes towards the use of digital HR tools combined statements, assessed by degree, related to the level of perceived usefulness, the added value of convenience for employees, the assessment of the level of effectiveness and readiness for use. At the same time, to assess the internal consistency of each composite, the Cronbach's α coefficient was used, which measures the degree to which the elements in a given scale reflect the same latent construct. The α values were calculated by analyzing the correlation matrix between the individual items of the index. Values above $\alpha > 0.70$ are considered an indicator of good reliability of the scale. In the present study, all indices used meet this threshold, which allows their subsequent use in the analysis.

The qualitative part of the study included 25 semi-structured interviews and three focus groups, each with 6 to 8 participants. The interviews were conducted with HR managers, HR experts, department heads and senior management representatives. The average duration of each interview was between 45 and 60 minutes. The interviews focused on the strategic aspects of digitalization, experiences with implementing HR technologies, barriers to transformation and subjective attitudes towards change. Focus groups were conducted with employees from different departments and provided data on daily practices, concrete examples of using digital tools and the dynamics of organizational attitudes. All interviews and group discussions were recorded, transcribed and analyzed through thematic coding.

Several important steps were taken to increase the reliability and validity of the study. The survey questionnaires and interview questions were pilot tested with a small group of participants to check the clarity of the wording and logic of the questions. Data from the different groups of participants were triangulated to compare the results and identify similarities and differences between employees, HR professionals and managers. The analysis included a comparison between organizations of different sizes and sectors, which contributed to a broader generalization of trends. Within the qualitative analysis, some of the participants were given the opportunity to confirm or comment on preliminary interpretations (member-checking), which added additional credibility.

The main objective of the study is to identify and justify the most effective strategies for digitalization in human resource management, by analyzing the main factors that support or hinder their successful implementation in organizations.

For the purposes of the study, the following hypotheses were developed:

Hypothesis 1 (H1): Employees working in organizations with a higher degree of digitalization of HR processes demonstrate more positive attitudes towards the use of digital HR tools.

Quantitative data (437 surveys) allow for the measurement of both attitudes and the degree of digitalization. The analysis of the data collected from the empirical study can confirm or reject this hypothesis. At the same time, the qualitative interviews complement the understanding by clarifying the reasons - for example, previous experience, organizational culture, level of education.

Hypothesis 2 (H2): HR professionals show a higher readiness to adopt digital HR solutions compared to employees who do not work in units performing HR functions.

The 113 HR professionals and 257 employees surveyed allow for comparison between groups. At the same time, qualitative interviews allow for interpretation of differences – for example, knowledge of the benefits, better access to training or a greater role in the implementation processes.

Hypothesis 3 (H3): Negative stereotypes and prejudices towards digitalization are more prevalent in organizations with low cultural and organizational readiness for change.

The survey results allow for the measurement of attitudes, stereotypes and organizational readiness. Qualitative data helps to determine which aspects of culture generate resistance. Focus groups add real examples and context for these stereotypes.

Hypothesis 4 (H4): Organizations that invest in training and digital competencies achieve more successful implementation of HR technologies.

The quantitative instrument contains questions about training, digital skills and actual use of technology. The interviews clarify what types of training are effective in this direction, where there are gaps and what is considered success. Thus, the mixed method approach provides both evidence and explanations.

Hypothesis 5 (H5): Organizations in which senior management is actively involved in the processes of digitalization of HR activities achieve a higher degree of actual implementation and use of digital HR tools.

The surveys measure both the degree of participation of management and the actual use of HR technologies, which allows for verification of the relationship. In turn, the interviews provide context for how and in what form this management support is implemented (for example, through resourcing, prioritization or the creation of internal change teams). Thus, the mixed method allows for capturing both the dependence and the mechanism behind it.

Hypothesis 6 (H6): There is a significant difference in attitudes towards digitalization between smaller and larger organizations.

The sample includes enterprises of different sizes. The quantitative part allows for statistical comparison by organizational scale. The qualitative part shows the reasons – for example, lack of resources, different priorities or different organizational structure.

4. Surveys Results

Sample description

The questionnaire was distributed both online and in person with representatives of the target groups. As a result, a total of 437 valid responses were received. The sample is structured as follows: 257 associates – in expert positions, 113 HRM specialists, 46 middle management managers, as well as 21 owners or top managers of companies. Such a diversity of representatives in the sample helps to capture the different points of view on the digitalization of HRM.

The respondents represent business and public organizations operating in 12 different sectors of the economy, including trade, services, manufacturing, IT, healthcare and others. At the same time, the study purposefully included companies of different sizes – from micro enterprises to large corporations operating on several continents. In this way, it is possible to analyze whether there is a relationship between the attitude towards digital technologies, especially in HRM, and the size of the company or the type of economic sector and the type of work.

In addition, 25 semi-structured interviews were conducted in face-to-face meetings with HR managers, experts, and team leaders. The average duration of the interviews was about 60 minutes, with the aim of gaining greater clarity and depth in how companies introduce new technologies and what difficulties they face in planning and implementing the change.

Three focus groups were also conducted with 6–8 participants each. The selection of participants in these focus groups was precise and included both representatives of HR departments and other specialists, as well as middle-level managers. The aim was to track the real, unspoken expectations of employees and management regarding the digitalization of HRM, the related stereotypes and attitudes, prejudices, fears, and expectations.

Quantitative Results

(H1): Employees working in organizations with a higher degree of digitalization of HR processes demonstrate more positive attitudes towards the use of digital HR tools.

To test this hypothesis, we used two main indicators from the survey. First, it was the degree of digitalization of HR processes, which was established by means of a composite index consisting of several elements such as: degree of use of online personnel selection systems, electronic forms for performance appraisal, automated administrative processes, including automated management decision-making related to career growth, providing incentives for well-done work or imposing penalties for non-performance. Second, were attitudes towards digital HR tools, which were measured by means of a complex assessment scale, encompassing statements about usefulness, convenience, efficiency and readiness for use. Both indicators showed good internal consistency ($\alpha > 0.70$), which allowed them to be used in the subsequent analysis.

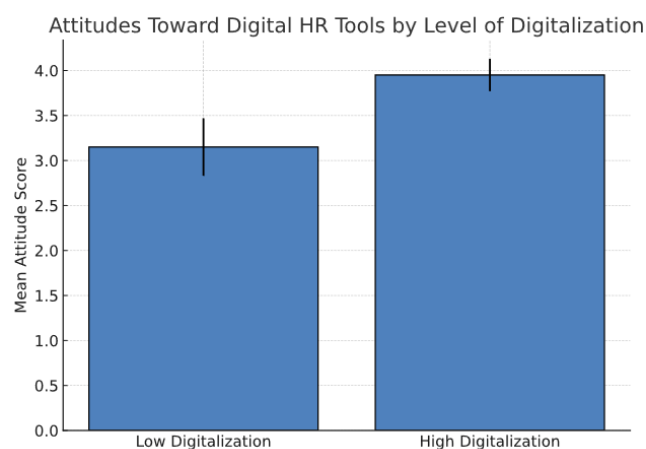


Figure 2. Attitudes toward digital HR tools as a function of organizational HR digitalization (H1).

Figure 2 compares the average attitudes towards digital HR tools in two groups of organizations classified according to the degree of digitalization of their HR processes – those with low digitalization and those with high digitalization. The vertical axis shows the average score from the composite attitude index formed on the basis of a Likert scale (e.g., from “strongly disagree” to “strongly agree”). The horizontal axis shows the two groups of organizations.

The results show a clear difference between the groups. The situation for organizations with low digitalization is the average attitude score of around 3.15. In reality, this reflects the much more moderate or, in other words, hesitant attitude of employees towards digital HR solutions. This result may be due to the lack of sufficient experience in using such digital tools, lack of practical conviction about the effects that such tools would have on the organizational climate and/or a direct lack of confidence in their usefulness.

In parallel, employees in organizations characterized by a high degree of digitalization show visibly more positive attitudes, with an average value of around 3.95. This indicates a better attitude towards the adoption of digital technologies in HR processes. This may be due to their better knowledge, including in terms of the benefits that such technologies bring, the completion of specialized training to work with such tools, clearer processes or personal positive experience from their exploitation.

The vertical error bars (Figure 2) depict the standard error of the mean, which allows us to assess the stability of the results within each group. The greater length of the error bar in the low digitalization group indicates greater variability in employee attitudes – that is, opinions are more heterogeneous. In the high digitalization group, the error is smaller, which suggests greater similarity in assessments and a more stable positive attitude.

Figure 2 visually confirms the trend identified in the quantitative analysis: the higher the degree of digitalization of HR processes, the more positive the attitudes towards the use of digital HR tools. The level of technological maturity of the organization, as well as the technological environment, have a significant impact on the perceptions and attitudes of employees.

Hypothesis 2 (H2): HR professionals show a higher readiness to adopt digital HR solutions compared to employees who do not work in units performing HR functions.

To confirm or reject this hypothesis, we used two main types of indicators. The first refers to the professional role of the survey participants. The respondents were divided into two main categories – the first of them are HR specialists ($n = 113$), and the second was formed by experts who do not work in units performing HR functions ($n = 257$). The second main indicator refers to the readiness that employees show regarding the adoption of digital HR solutions. We establish it through a scale that includes various statements about the desire to use digital tools, including expected usefulness from using digital solutions, as well as confidence in one's own knowledge and skills in handling such digital tools, as well as attitudes towards the introduction of new digital solutions. The scale showed good internal consistency ($\alpha > 0.75$), which allows a reliable comparison between the two groups.

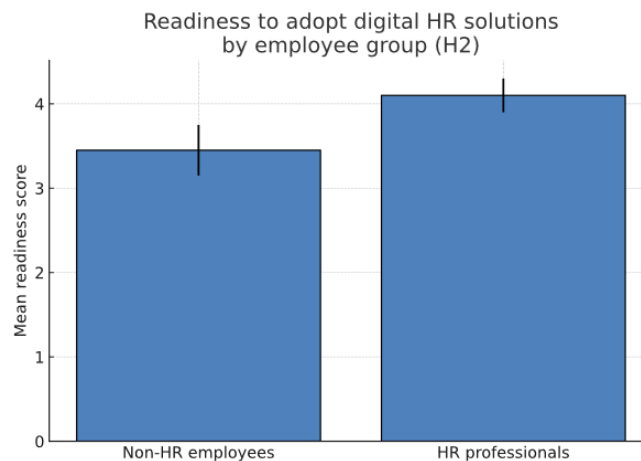


Figure 3. Mean readiness to adopt digital HR solutions among non-HR employees and HR professionals (H2).

Figure 3 presents a comparison of the average values indicating the readiness to adopt digital HR solutions by the two main groups of participants – experts who do not work in human resources departments (Non-HR employees) and HR professionals themselves (HR professionals). The vertical axis shows the average value of the readiness index. It is determined according to answers to a series of statements assessed using a Likert scale. The horizontal axis presents the two compared groups. As can be seen from the graph, the results show a relatively clear difference between the two main categories of participants. The average readiness score among employees who do not professionally deal with HR functions is approximately 3.45. This result can be interpreted as a more moderate attitude on their part towards the use of new digital HR tools. This value also suggests a certain caution, which is most likely due to the relatively rare interaction with such technologies, as well as more limited awareness of their capabilities. At the same time, it may also be due to expectations for changes that are not sufficiently well communicated at the organizational level.

In contrast, HR specialists show a relatively higher level of readiness, with an average value of around 4.10. This demonstrates a more clearly expressed positive attitude towards the introduction and use of digital HR solutions. The higher result can be explained by professional knowledge of tools such as information systems and their real effectiveness, by the use of electronic recruitment platforms, performance appraisal systems and making management decisions based on systematic data analysis provided by such digital systems. It is also possible that HR specialists have higher digital competence specifically in the field of HR tools, which con-

tributes to a more confident attitude towards the new opportunities that technologies provide, including in the field of HRM.

The vertical error bars represent the standard error of the mean (see Figure 3), which provides information about the variation of the scores within each group. The longer error bars for employees outside HR roles indicate a greater diversity in their attitudes – in this group, opinions range from more positive to more reserved. In the HR professionals' group, the error bars are shorter, suggesting greater consistency of assessments and a more sustained positive attitude towards digital HR solutions. The graph clearly visualizes the trend also established through the analyses of the empirical data: HR professionals demonstrate a higher readiness to adopt digital HR tools compared to employees who do not work in HR units. This conclusion supports Hypothesis 2 and confirms that professional role has a significant impact on attitudes towards digitalization in the field of human resource management.

Hypothesis 3 (H3): Negative stereotypes and prejudices towards digitalization are more prevalent in organizations with low cultural and organizational readiness for change.

We relied on two main indicators to be able to test this hypothesis – to confirm or reject it. The first indicator is about cultural and organizational readiness for change. From this perspective, respondents were grouped into two categories based on a composite index: organizations with low readiness for change and organizations with high readiness for change. The index consisted of a series of statements related to openness and readiness to introduce and adopt innovations, flexibility and adaptability of work processes, support from management and perceived level of change by employees. The scale showed high internal consistency ($\alpha > 0.80$), which allows for reliable classification of organizations. The second indicator measures the presence and intensity of negative stereotypes and prejudices towards digitalization in terms of specific HRM processes. It consisted of statements that tested employees' concerns about fears related to excessive control and automation of the measured performance of each employee, fears related to loss of autonomy and even to some extent infringement of basic human rights (e.g., related to excessive control), loss or retreat of people from management decision-making at the expense of algorithms, doubts about the reliability of digital tools, and concerns related to excessive complexity. This scale also showed good internal consistency ($\alpha > 0.78$).

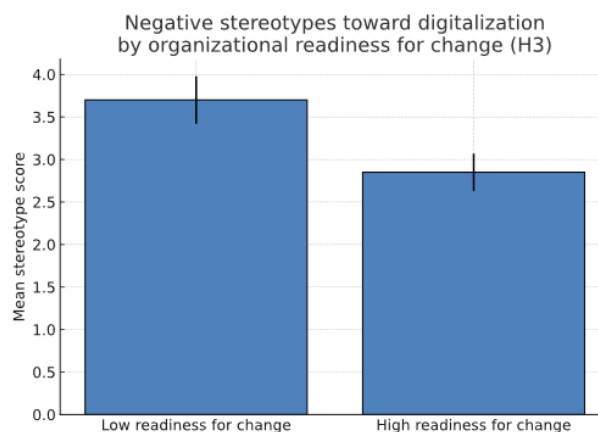


Figure 4. Evaluation on the remote assessment effectiveness, in %

Figure 4 presents a comparison of the mean values of negative stereotypes and prejudices towards digitalization between two groups of organizations classified according to their cultural and organizational readiness for change. The vertical axis shows the mean value of the negative stereotype index, formed using a Likert scale. The horizontal axis shows the two studied groups: organizations with low readiness for change and organizations with high readiness for change.

The results show a clear difference between the groups. In organizations with low readiness for change, the mean value of negative stereotypes is approximately 3.70, which indicates more pronounced reservations and

concerns about digital technologies. This higher value can be explained by a more conservative organizational culture, weaker or directly ineffective communication about technological changes, as well as previous unsuccessful attempts to implement digital solutions in various processes in the organization. In contrast, organizations with high readiness for change demonstrate a significantly lower mean value — around 2.85. This clearly shows a more positive, constructive and open-minded attitude towards digitalization in HRM, higher trust in technological processes in general and in the field of HRM in particular, as well as a more positive assessment of the benefits that their implementation can bring to the organization.

The vertical error bars represent the standard error of the mean (see Figure 4), through which the stability of the results is assessed. It is noticeable that the error bar in the low readiness group is longer, which indicates greater variability and diversity in attitudes. This means that in these organizations there is a mixed picture - some employees show moderate reservations, while others express a strongly negative attitude. In the high readiness group, the error bars are shorter, which should be explained by their more unified and relatively clearly expressed positive attitude towards digitalization.

Figure 4 clearly visualizes the trend established by statistical tests: negative stereotypes are significantly more pronounced in organizations with low readiness for change, which supports Hypothesis 3. This reasonably leads to the conclusion that the role of organizational culture is decisive for the overall readiness of employees for change, including the successful adoption of digital technologies in the field of HRM for the needs of the respective organization.

Hypothesis 4 (H4): Organizations that invest in training and digital competencies achieve more successful implementation of HR technologies.

To establish the validity or reject this hypothesis, two main indicators were used. The first indicator is the degree of investment in training and development of digital competencies of employees in organizations. It was measured using a composite scale that included various elements such as: frequency of training, types of training provided (technical, software, process), access to training organized for the needs of the organization (internal) or to external training organized by specialized training organizations; availability of comprehensive programs for improving digital skills. The composite scale also included the subjective assessment of employees about the attitude and support from the organization and management for the overall development of digital capabilities. The scale showed high internal consistency ($\alpha > 0.82$). The second indicator measures the success of the implementation of HR technologies. It was established using indicators such as: degree of actual use of the implemented tools, level of employee satisfaction with digital HR systems, ensuring a smooth transition in the transformation and transition from traditional to digital processes, as well as the level of perceived efficiency, benefit and added value of new technologies. This scale also demonstrates good reliability ($\alpha > 0.80$). For the purposes of the analysis, organizations were divided into two groups according to the level of investment in training: organizations with low investment and organizations with high investment.

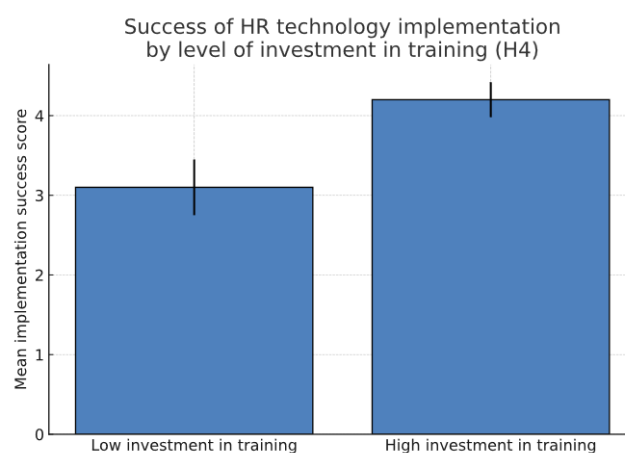


Figure 5. Success of HR technology implementation by level of investment in training (H4)

Figure 5 compares the average success rates of HR technology implementation in two groups of organizations, determined by the level of investment in training and development of their employees for the purposeful deepening of their digital competencies. The vertical axis shows the average value of the implementation success index, which is based on Likert scale ratings. The horizontal axis shows the two main groups – organizations with low investment in training and organizations with high investment in training. As can be seen from the graph, organizations with low investment in training and development of digital competencies of employees reach an average success index value of around 3.10. This indicates a much more limited success rate in implementing HR technologies, which in turn includes a lower degree of actual use of the systems, more frequent experience of difficulties in working with them and relatively more moderate employee satisfaction. The longer error bar in this group also shows greater variability in the estimates – in some organizations the implementation is more successful, but in others it encounters serious difficulties, which indicates an unstable and heterogeneous process.

In the group of organizations with high investments in training, the average value of the success index reaches approximately 4.20. This result, in turn, can be interpreted as achieving significantly better results in the digital transformation in the field of HR. In these organizations, digital tools are used more actively and systematically, employees declare higher satisfaction with working with them, and the transition from traditional to digital processes is assessed as smoother and more managed. The error bars here are shorter, which indicates greater consistency of the estimates and a more stable positive perception of the implemented technologies.

The vertical error bars represent the standard error of the mean (Figure 5), which allows us to assess the stability of the results within each group. The longer error bars for low-investment organizations indicate a wider range of estimates and a stronger dependence on the specific context, while the shorter error bars for high-investment organizations indicate a more uniform perception of the benefits of training and technology. The graph clearly shows the trend also established by the analysis of the empirical data: organizations that invest purposefully in training and development of digital competencies achieve more successful implementation of HR technologies. Thus, Figure 5 provides strong and clear support for the validation of Hypothesis 4. In this way, the role and importance of training as one of the main elements for a successful digital transformation in human resources management becomes extremely clear.

Hypothesis 5 (H5): Organizations in which senior management is actively involved in the processes of digitalization of HR activities achieve a higher degree of actual implementation and use of digital HR tools.

To test the validity of this hypothesis, we again used two main indicators. The first one measures the activity and commitment of senior management in digitalization processes. This indicator is also based on a composite index assessment, including statements about: providing strategic support from senior management for the overall digital transformation process, active participation of management in planning and decision-making in this process, systematic and targeted provision of resources for technology implementation, active participation in communication related to clearly explaining the goals of digital transformation, as well as the presence of clearly expressed leadership encouraging innovation. The scale showed high internal consistency ($\alpha > 0.85$).

The second indicator measures the degree of actual implementation and use of digital HR tools. It includes elements such as: the frequency of use of HRIS systems in the organization, the use of systems in electronic selection of new employees, making decisions about online training, electronic platforms for managing and evaluating the performance of employees, automation of administrative processes and integration of systems for analyzing HR data. The scale demonstrates good reliability ($\alpha > 0.80$).

For the purposes of the analysis, the organizations were divided into two groups: organizations with low involvement of senior management and organizations with high involvement of senior management.

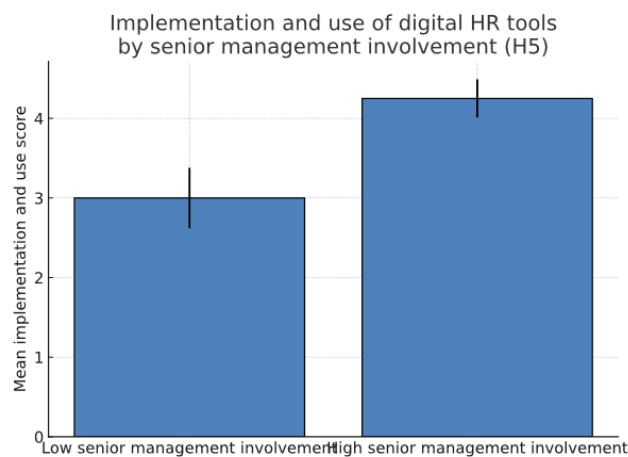


Figure 6. Mean level of implementation and use of digital HR tools in organizations with low and high senior management involvement (H5)

Figure 6 above compares the average values of the degree of actual implementation and use of digital HR tools in two groups of organizations, which are in turn determined by the level of engagement of senior management in digitalization processes. The vertical axis shows the average value of the index for implementation and use of digital HR tools, formed on the basis of a Likert scale. The horizontal axis shows the two compared groups: organizations with low engagement of senior management and organizations with high engagement of senior management.

In organizations where senior management is not engaged in the digitalization processes of HRM, the average value of the index is approximately 3.00. This result indicates a relatively limited and less systematic use of digital HR tools. In organizations of this type, digital solutions often remain at the level of partial implementations, being used only by certain departments or applied in a limited number of HR processes. The vertical error bar in this group is relatively longer, which indicates greater variability in the estimates. This could lead to the conclusion that the degree of implementation is very heterogeneous between individual organizations, as well as between the units within these organizations themselves - in some of them digitalization is developing more successfully, while in others it is almost absent.

In contrast, organizations with high senior management commitment show a significantly higher average value - around 4.25. This value reflects a larger-scale, more strategically consistent and sustainable implementation of digital HR tools. In these cases, digital solutions are integrated into core HR practices, testifying to their active use in daily work. At the same time, the implementation itself is supported by resources, clear communication and strategic visionary planning. The error bar for this group is shorter, which means lower variability and more stable estimates within different organizations. This is an indicator of a coherent and more successful digitalization process.

The vertical error bars represent the standard error of the mean (Figure 6), which provides important information about the reliability of the estimates. The longer error line in low-engagement organizations highlights the instability and inconsistency of processes. At the same time, the shorter error line in high-engagement organizations shows that digitalization is implemented much more evenly there. The visual results clearly confirm the empirical trend established through the analysis of the empirical data, from which the unambiguous conclusion follows that the active engagement of senior management is extremely important for a higher degree of real implementation and use of digital HR tools. Figure 6 directly supports Hypothesis 5, emphasizing the importance of leadership as a driver of successful digital transformation.

Hypothesis 6 (H6): There is a significant difference in attitudes towards digitalization between smaller and larger organizations.

To test this hypothesis, we used two main indicators. The first one is related to the size of the organization, based on the number of employees employed in it. For the purposes of this analysis, organizations were classified into two categories: small organizations – those with up to 50 employees and large organizations – with over 250 employees. This categorization is in accordance with generally accepted criteria in management and organizational research, as well as in accordance with applicable European legislation in this area. The second indicator is the attitude towards digitalization itself, measured by a multi-component scale, including statements about the perceived usefulness of digital HR tools, their convenience in use, expected effect on process efficiency, trust in technologies and readiness to work with modern digital solutions. The scale showed excellent internal consistency ($\alpha > 0.86$).

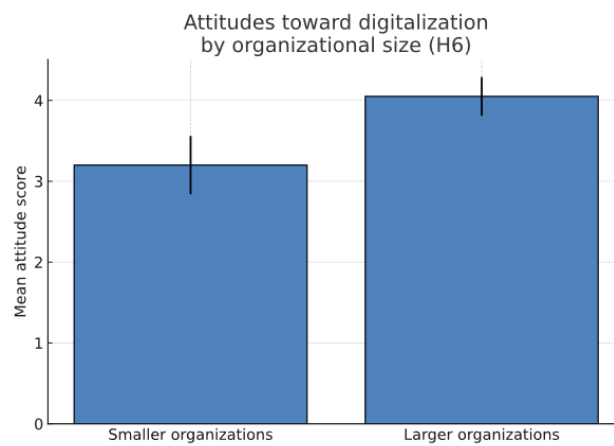


Figure 7. Mean attitudes toward digitalization in smaller and larger organizations (H6)

Figure 7 presents a comparison of the average values of attitudes towards digitalization between smaller and larger organizations. The vertical axis shows the average value of the attitude index towards digitalization, formed on the basis of a series of statements rated on a Likert scale. The horizontal axis shows the two groups: Smaller organizations and Larger organizations. The average value of the attitude index towards digitalization in smaller organizations is approximately 3.20. This value is indicative of a slightly positive, but at the same time rather cautious attitude towards digital solutions. Such organizations are often characterized by relatively serious limitations in terms of resources, technological infrastructure and personnel. This, in turn, reflects greater caution, including hesitation when introducing new digital tools. The vertical error bar for this group is relatively longer, which indicates greater variability in assessments – some employees are more open to digitalization, while others remain more reserved.

In larger organizations, the average value of the same index is significantly higher — around 4.05. This indicates more clearly expressed positive attitudes towards digitalization. In these organizations, digital technologies are more often integrated into the main processes, there is a more developed IT infrastructure, and employees more often have experience with various digital systems, including in the field of human resources management. The error bar in large organizations is shorter, which indicates lower variability and a more stable positive attitude among employees. The vertical error bars represent the standard error of the mean, allowing to assess the stability and reliability of the estimates. The larger range in smaller organizations suggests that in them the processes of digital transformation are more heterogeneous, while in larger organizations the attitudes are more consolidated.

Figure 7 clearly presents the trend established by the quantitative analysis: attitudes towards digitalization are more positive in larger organizations than in smaller ones. This supports Hypothesis 6 and highlights the importance of organizational size and related technological maturity as factors directly influencing the adoption of digital transformation.

Qualitative Results

The qualitative component of the study aims to build on the quantitative results by providing a deeper understanding of the mechanisms behind the attitudes and behaviors of different groups of participants regarding the digitalization of HR activities. For this purpose, data from 25 semi-structured interviews and 3 focus groups conducted with employees, HR professionals and management representatives from organizations of different sizes and sectors were used. The analysis of the qualitative data was conducted through thematic analysis, which allows for the systematic identification, grouping and interpretation of recurring patterns and meaning in the participants' statements.

During the analysis, three main themes were outlined that most clearly describe the attitudes and experiences of the participants regarding digitalization:

1. Perceived benefits of digitalization – includes descriptions of specific advantages, increased efficiency and improved process management.
2. Barriers and challenges – focused on the lack of skills, resistance to change, technical difficulties and organizational constraints.
3. The role of management and organizational culture – reflecting the ways in which leadership, communication and support from management shape attitudes towards digitalization.

Each of these themes includes several subcategories that describe in more detail the observed patterns in the data. They are illustrated with selected quotes that allow the logic and argumentation of the participants to be followed. The qualitative results are presented in a way that first complements the justification of the quantitative trends; provides a deeper understanding of the processes behind the hypotheses; reveals the contextual factors that influence attitudes, behavior and actual use of digital HR tools.

Theme 1: Perceived benefits of digitalization

The first theme that stands out in the analysis of the interviews and focus groups is the perceived benefits of the digitalization of HR processes. These benefits manifest themselves in several very clearly defined areas. It is striking that they are largely shared by participants in different roles and by representatives of organizations of different sizes. However, HR specialists and employees from large organizations demonstrate a higher awareness of the strategic advantages of digitalization, while participants from small organizations emphasize more operational and immediate conveniences.

Subcategory: Increased efficiency and time savings

One of the most frequently cited benefits is related to the reduction of administrative burden and optimization of time. Participants share that digital tools significantly speed up work and allow for faster processing of requests, documents and inquiries. These statements are particularly strongly expressed among HR specialists. *“Automation frees us from hours of routine work. We used to keep everything in spreadsheets, now the system does it all by itself.”* (HR manager, large organization)

“Even just electronic leave requests have saved us a lot of time. We don't run around the rooms for signatures.” (employee, small company)

This subcategory qualitatively explains the higher quantitative scores in the groups with higher digital maturity.

Subcategory: Improved transparency and traceability of processes

Many participants emphasize that digital HR platforms allow for clear tracking of processes and actions — from requesting leave to evaluating performance. This creates a sense of greater fairness and consistency.

“The system provides visibility – we all see the same thing. This eliminates a lot of misunderstandings.” (employee, large organization)

Transparency is perceived as a very important element in creating trust in systems, especially among employees who previously distrusted traditional procedures.

Subcategory: Better decision-making through access to data

One of the most distinct benefits cited by HR representatives is the ability to work with up-to-date and reliable data, which facilitates analysis.

“We have real-time data. Decisions for training, assessments, selection – everything is now supported by evidence, not intuition.” (HR business partner)

This subcategory supports the quantitative results in H1 and H2, which show a higher positive attitude in digitally advanced organizations.

Subcategory: Improved employee experience

Participants from all groups share that digitalization makes everyday tasks easier – submitting requests, communicating with HR, accessing documents and information. This improves the overall experience in the organization, especially for employees who actively use online platforms.

“When everything is on the phone, it’s just easier. You don’t depend on the workplace, on papers, on HR.” (employee, large IT company)

These subcategories clearly show that the perceived benefits of digitalization are in fact multi-layered and affect both the individual experience of employees and strategic business processes. Theme 1 supports the trends observed in the quantitative analysis — especially the differences between HR professionals and employees outside the HR function (H2), as well as between small and large organizations (H6). It reveals the reasons for the more positive attitudes in organizations with a higher level of digitalization and a more developed technological environment.

Theme 2: Barriers and challenges to digitalization

The second theme, extracted from the qualitative content, is related to the main barriers and difficulties that organizations encounter when implementing and using digital HR tools. These obstacles manifest themselves both at the individual and organizational level. They are the basis for explaining the lower quantitative values in smaller, less digitally mature or culturally unprepared organizations. Several subcategories stand out in the analysis, describing the main difficulties.

Subcategory: Lack of sufficient digital skills and the resulting insecurity

One of the most common barriers, especially among employees who do not work in HR, is the lack of sufficient digital competencies or confidence in their own abilities. Participants emphasize that uncertainty when working with new technologies often creates stress.

“I am afraid of making a mistake. We are not properly trained and this stops us.” (employee, focus group)

“Some colleagues want to work the old way because they feel more secure.” (employee, small company)

This subcategory explains the differences observed in quantitative results between HR and non-HR employees (H2), as well as the lower adoption of digitalization in small organizations (H6).

Subcategory: Resistance to change

Resistance to change is the second main barrier. Some participants perceive digitalization as a threat to the established way of working, have concerns about the level and quality of control, especially in terms of assessing task performance, or as an additional burden. This resistance is not always overt; it often manifests itself in passive postponement or neglect of new systems.

“We have people who say: ‘I don’t see why we should change something that works.’ It slows us down a lot.” (HR professional)

“To be honest, for me it was unnecessary complications. I’m used to doing things differently.” (employee, large organization)

This barrier is particularly pronounced in organizations with low cultural readiness for change, supporting the quantitative trends in H3.

Subcategory: Lack of resources and capacity

Representatives of small organizations share that limited financial and human resources hinder the implementation of modern HR technologies. There is often a lack of sufficient financial resources, sufficient time for training or technical support.

“With us, it’s all about money and time. We have the desire, but we don’t have the capacity to maintain such systems.” (small company owner)

Resource limitations are one of the leading reasons for lower attitudes towards digitalization in small organizations (H6).

Subcategory: Technical difficulties and usability issues

Participants from various sectors emphasize that some digital tools are too complex, with a difficult-to-understand user interface or insufficiently good functionality. Technical difficulties often increase resistance and reduce trust in digitalization.

“The system is not intuitive. You have to press five buttons for something very basic.” (employee, large company)

“When the platform crashes, people immediately say: ‘That’s why we don’t want such systems.’” (HR expert)

Subcategory: Lack of adequate support and training

Many participants commented on the insufficient preparation and lack of support during the implementation of new systems. This reinforces the feeling of difficulty and leads to negative attitudes.

“They launched the new system, but no one really trained us. How can we be positive?” (employee, focus group)

It is directly related to the quantitative results of H4, which show that investments in training increase the success of implementing digital solutions.

Theme 2 emphasizes that the obstacles to digitalization are multifaceted and manifest themselves at the technological, individual and organizational levels. The differences between the groups — HR vs. non-HR employees, small vs. large organizations, culturally prepared vs. unprepared teams stand out significantly. These barriers explain many of the quantitative trends identified in H2, H3, H4, H5, and H6. Qualitative data shows that successful digitalization involves more than just technology, but requires targeted support, training, strategic leadership, and the right organizational culture.

Theme 3: Role of Management and Organizational Culture

The third theme that consistently emerged in the interview and focus group data is related to the leading role of management and organizational culture in digitalization processes. Participants at different levels emphasized that the implementation of digital HR tools is not just a technological project, but a deeply organizational process that depends on leadership, communication, and cultural readiness for change. Several key subcategories emerged in the analysis.

Subcategory: Strategic support from senior management

Participants consistently emphasized that the role of senior management is crucial for the success of digitalization. When management demonstrates different levels of commitment — through resources, clearly set goals, and continuous communication — employees accept the changes more easily and positively.

“When our director explained why it was important to move to a digital system, people started to take the process much more seriously.” (HR manager, large organization)

“If management does not set an example, no one will believe that new tools are a priority.” (employee, mid-level)

This directly supports the quantitative results of H5, according to which active engagement by senior management is associated with a higher degree of actual implementation.

Subcategory: Importance of communication and explaining goals

Participants strongly stated the need for a clear explanation of why new systems are being introduced, what benefits are expected and what will change in daily work. The lack of effective communication often leads to resistance, uncertainty, increased fears, unlocking stereotypes and spreading concerns.

“People are not afraid of the system itself. They are afraid of the ambiguity – what will happen to their work.” (team leader)

“When communication is good, resistance also decreases.” (employee, focus group)

This subcategory is closely related to the quantitative results of H3, related to stereotypes and prejudices.

Subcategory: Role of HR in Change

HR participants often identify themselves as key players who need to mediate between management and employees. They describe themselves as people who “translate” digital solutions and convince employees of their benefits.

“We are the ones who need to convince both management and people. Without HR, there is no one to drive the process.” (HR professional)

In some organizations, this role is also taken on by technology teams or team managers who have authority among employees.

Subcategory: Organizational climate that encourages innovation

Another important subcategory is related to the culture of accepting new ideas. In organizations characterized by openness, support and a learning orientation, digitalization is perceived significantly more positively. However, in more conservative, more static or strictly hierarchical structures, the process often encounters barriers.

“Once we got used to trying new tools, people started to accept them more easily.” (employee, large company)

“It’s difficult for us — every new thing is met with suspicion.” (employee, small organization)

Subcategory: Lack of cultural readiness for change

Some participants indicated that organizational culture sometimes works against digitalization — for example, when traditional work habits, suspicion of technology, or reluctance to take risks prevail.

“We simply don’t have a culture of change. Even the best software would be difficult to implement.” (HR expert)

This confirms the quantitative trends in H3, which link negative stereotypes to low organizational readiness.

Theme 3 clearly shows that digitalization is highly dependent on the quality of leadership and the degree of organizational readiness. Senior management makes the decision for digital transformation, while HR professionals should be mediators in this process, but in reality, the general organizational climate determines whether digital processes will be perceived positively or not. In this sense, the qualitative data provide an explanation for the results of H4, H5, and H6 and provide a complete interpretive framework for the quantitative differences identified.

5. Strategies for digitalization of human resource management

Based on the quantitative and qualitative results, several important strategies can be formulated that support the successful digitalization of human resource management. They relate to both the technological and organizational aspects of the process and provide a basis for sustainable and effective implementation of digital HR solutions.

1. Strategic leadership and active support from senior management

Effective digitalization requires clear leadership, prioritization of the process and consistent support from senior management. This includes: formulating a long-term digital HR vision; providing the necessary resources; communicating the goals and benefits to employees; and management commitment at key stages of the implementation. The results show that organizations with active support from management achieve a significantly higher level of actual implementation and use of HR technologies (confirmation of H5).

2. Investing in training, development and digital competencies

Digitalization can only achieve maximum effect if employees have the necessary skills and the resulting confidence. Effective strategies include: periodic training on new HR platforms; comprehensive programs to de-

velop basic and advanced digital competencies; creation of internal “digital mentors”; support and adapted training for groups with lower digital confidence. This strategy directly stems from the results of H4.

3. Design and selection of user-oriented digital HR tools

To be adopted and used, HR systems must be intuitive, easy to navigate, adapted to the specific processes in the organization, integrated with other internal platforms. Qualitative data shows that the complexity of the systems and technical difficulties are major barriers.

4. Gradual and phased implementation, supported by robust communication

Effective implementation strategies include pilot projects or small test groups; phased expansion to organizations or teams; regular internal communication about benefits and goals; collecting feedback and adapting processes. This reduces resistance to change and supports cultural readiness (direct link to H3).

5. Creating a cultural environment that supports innovation

The cultural aspect is an important factor shaping the attitude towards digitalization. Effective strategies include: encouraging experimentation and tolerance for mistakes; recognizing and encouraging initiative; introducing mechanisms for the exchange of good practices; creating an organizational climate that rewards adaptability. These elements explain the differences in attitudes between small and large organizations (H6).

6. Optimal use of data for decision-making (data-driven HRM)

Successful HR digitalization leads to a significant improvement in data quality. Effective strategic steps include: developing standards for data collection, processing and analysis; integrating analytical tools into HR processes; using data for strategic planning, forecasting and process improvement. The results of the interviews confirm that improved decision-making is one of the most strongly perceived benefits.

7. Personalizing digital HR solutions according to the organization

Digitalization should not be seen as a universal model. Successful organizations adapt systems to their needs and characteristics; involve end users in the process of developing or selecting a system; avoid overly standardized solutions that do not correspond to real processes.

The proposed strategies are tailored to the specific challenges identified in this study. They unite the technological, human and organizational aspects of digitalization and provide a practical framework for the sustainable development of digital HR processes.

5. Conclusions

The present study shows that the digitalization of human resource management is a comprehensive strategic and cultural process that transforms relationships in the organization. The higher the degree of digitalization of HR processes, the more positive the attitudes towards digital tools, especially in larger and technologically mature organizations. HR specialists demonstrate a higher readiness to adopt digital solutions compared to other employees, and investments in training, development of digital competencies and the active participation of senior management are directly related to the more successful introduction and actual use of HR technologies. At the same time, organizations with low cultural and organizational readiness for change are characterized by more pronounced negative stereotypes, fears and resistance to digitalization, which confirms the central role of organizational culture.

The study contributes to providing further understanding of the digital transformation of organizations related to HRM processes. On a practical level, the results of the study set a clear direction for the development of HRM, which is based on strong strategic leadership, targeted investment in digital skills, the choice of user-oriented HR systems. At the same time, a comprehensive process of transparency and continuous communication, as well as responsible management of risks, especially those related to the increasing use of algorithmic management and the resulting concerns and ethical aspects of AI in HRM. The limitations of the study are related to the fact that the data refer to a single country, as well as the relatively limited sample. However, the

results clearly show that the sustainable digitalization of HRM requires a holistic approach focused on a balance between technology and people and specific organizational goals.

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