

Modern Technologies in Knowledge Management in HR Processes in Organizations

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Abstract: The paper examines the role of modern technologies in knowledge management within HR processes, emphasizing their importance for building a competitive advantage in the era of digital transformation. It has been demonstrated that organizations are increasingly utilizing advanced IT tools to support key HR functions, such as recruitment, onboarding, competency development, performance evaluation, and talent management. Based on qualitative research involving HR department employees, the most commonly used technologies were identified, including Artificial Intelligence, Applicant Tracking Systems (ATS), Human Resource Management Systems (HRM), HR process automation (workflow automation), Learning Management Systems (LMS), and Robotic Process Automation (RPA). These technologies enable the automation of repetitive tasks, the analysis of HR data, and the personalization of training programs while also supporting the development of an organizational culture based on knowledge sharing. Although the study was of a pilot nature, the obtained results provide a basis for further quantitative analysis. The next stage will involve a survey aimed at assessing the extent to which modern IT technologies are used in knowledge management within HR, as well as identifying their strengths and weaknesses and the benefits and barriers associated with their implementation.

Keywords: Knowledge management, HR functions, Information technology, Artificial intelligence, Big Data analytics, Robotic process automation

1. Introduction

Modern organizations operate in a dynamically changing environment, which forces them to constantly adapt, innovate, and effectively manage intangible resources, especially knowledge. In this context, knowledge management (KM) is becoming one of the key elements in building competitive advantage for companies. It plays a crucial role in human resource management (HR), where the employees' knowledge, competence, experience, and ability to learn organizationally are the foundation for the effectiveness of personnel processes.

The personnel function was one of the first areas of business activity for which information technologies began to be implemented. These technologies were and still are primarily used to automate personnel administration processes – to carry out the so-called transactional function. The development of technologies that increasingly enable the virtualization of the personnel function has also made it possible to implement HR processes in the transformational domain, covering key HR areas such as employee competencies, development, employee evaluations, career paths, and talent management (Urlich et al., 2001).

Modern technologies enable the data integration from multiple sources, automation of recruitment and training processes, predictive analysis of HR data, and creation of intelligent systems supporting HR decisions. Their deployment influences both operational efficiency and the organization's potential to develop a culture centered on learning and innovation. HR digitization is playing an increasingly important role in organizations (Prasad et al., 2024). According to a study by Deloitte and Randstad (2017), the digitization of HR processes ranked seventh in the ranking of the most essential tasks of HR departments.

The purpose of this article is to identify the role of modern technologies in knowledge management in HR processes in organizations. In particular, the focus is on defining technologies supporting HR processes, assessing their impact on knowledge management, and indicating the challenges and barriers associated with their implementation. Based on this objective, the following research questions have been formulated:

RQ1. What are the most relevant modern technologies applied to knowledge management in HR processes?

RQ2. How do these technologies contribute to the efficiency and effectiveness of HR knowledge management?

RQ3. What are the benefits and limitations of implementing modern technologies in HR knowledge management?

The article presents key findings from qualitative research—interviews conducted with HR department employees aimed at defining a set of the most important technologies used in knowledge management within HR processes in modern organizations, as well as assessing their potential.

2. Background

To present the theoretical foundations and define the research gap, a systematic literature review was conducted. Three main thematic blocks and their combinations were analyzed in scientific publications (in their titles, abstracts, and keywords) indexed in the Scopus database—see Table 1:

- Main thematic blocks (blue cells),
- Combinations of main thematic blocks (green cells).

Table 1: Summary of the number of indications for selected keywords in the Scopus database

Keywords	Number of publication	Number of publications in the subject categories of “ <i>Business, Management and Accounting</i> ”
Knowledge Management	65954	5236
Human Resource Management	13322	1971
Information Technology	88355	8089
Knowledge Management and Human Resource Management	1931	322 (40)*
Knowledge Management and Information Technology	3001	479 (52)*
Human Resource Management and Information Technology	573	120 (14)*
Knowledge Management and Human Resource Management and Information Technology	149	39 (5)*

* Number of open access publications in English

Source: own elaboration base on Scopus database

The conducted quantitative analysis reveals that the body of domain-specific literature contains relatively few publications that offer a comprehensive examination of the use of advanced information technologies in knowledge management within the organization's HR functions.

2.1 Knowledge Management in HR Processes

Knowledge management is the systematic process of acquiring, organizing, sharing, and utilizing knowledge within an organization to achieve strategic goals. In the literature, knowledge is perceived as a key intangible resource; when effectively leveraged, it can serve as a source of competitive advantage (Sánchez et al., 2025). In the context of organizational management, knowledge management acts as a glue between strategy, organizational culture, and business processes (Shen et al., 2024). It is present at the operational level (e.g., employee training) and the strategic level (e.g., building a learning organization), (Contreras et al., 2024). In HR departments, knowledge management not only supports the development of employee competencies but also enables critical knowledge to be consolidated and shared within organizational structures.

Key HR processes related to knowledge are:

- Recruitment,
- Onboarding,
- Competency development,
- Succession,
- Retention.

The process of hiring a new employee involves the collection and analysis of knowledge about the labor market, candidates' competencies, and the organization's needs. This knowledge enables the effective alignment of the candidate's profile with the organizational culture and the specific requirements of the position (Apascariet, Elvira, 2022).

The onboarding of a new employee is a moment of intensive knowledge transfer—both formal (e.g., procedures, regulations) and informal (e.g., customs, norms). A well-designed onboarding process enables the employee to reach full effectiveness more quickly (LaMont, Lucey, 2022).

Knowledge management is an integral part of training policy. Organizations identify competency gaps, plan development activities (such as training, coaching, and mentoring), and then monitor their outcomes. Knowledge regarding the effectiveness of various learning methods is also collected and analyzed (Piwowar-Sulej et al., 2022).

The succession process requires the identification of critical knowledge—essential for the functioning of the organization—and its transfer across employee generations. Knowledge accumulated by experienced employees must be systematically passed on to their successors (Salvadorinho et al., 2024).

Talent retention is closely linked to preserving knowledge within the organization. The departure of an employee often simultaneously means the loss of the knowledge they have accumulated. Therefore, retention mechanisms (e.g., career paths, engagement strategies, organizational culture) are crucial in minimizing the risk of knowledge loss (Al Nsour, Abu Tayeh, 2018).

In knowledge management, two main types of knowledge are distinguished: explicit and tacit knowledge. Explicit knowledge refers to knowledge that can be documented, cataloged, and transferred through materials such as documents, procedures, and databases. In the HR context, this may include onboarding manuals, competency frameworks, workplace regulations, or performance evaluation systems. Tacit knowledge, on the other hand, is difficult to formalize and is embedded in personal experience, intuition, and individual competencies. Examples in HR include the ability to conduct challenging recruitment interviews, intuition in assessing employee potential, or knowledge about team dynamics. Knowledge management in HR should aim to extract tacit knowledge—for example, through mentoring, job shadowing, or collaborative projects—and to effectively capture and distribute explicit knowledge, ensuring it is accessible across the organization (Shen et al., 2024).

2.2 Modern Technologies Supporting Knowledge Management in HR

In the age of digital transformation, modern technologies play a key role in knowledge management within HR departments (Contreras et al., 2024). They not only enable the efficient collection, processing, and distribution of knowledge but also support the development of competencies, analysis of HR data, and automation of many processes related to human capital (Indradevi et al., 2024).

Information and communication technologies (ICT) form the foundation of digital transformation in HR (Manekar, 2024). They encompass a wide range of tools, such as computer systems, databases, web applications, communication networks, and online collaboration platforms. In the context of knowledge management, ICT enable:

- the storage and sharing of knowledge (intranet, knowledge bases),
- internal communication (chats, videoconferences, social platforms),
- support for remote and hybrid work,
- automation of HR processes through integration with other systems.

Information systems dedicated to knowledge management are referred to as Knowledge Management Systems (KMS). These are specialized tools that support processes related to the creation, storage, sharing, and utilization of knowledge within an organization. In HR, their functions include, among others (Apascaritei, Elvira, 2022):

- building knowledge bases (FAQs, procedures, instructions),
- cataloging employee competencies,
- supporting collaboration and knowledge sharing (forums, wikis, social platforms),
- integration with performance, training, and talent development systems,
- analyzing competency gaps and forecasting training needs.

Key technologies supporting knowledge management in HR include:

- Big Data technology and data analysis methods (Zhang et al., 2021),
- artificial intelligence, chatbots, and virtual assistants (Bastida et al., 2025),
- Robotic Process Automation (RPA) (Ulatowska et al., 2023).

Big Data is a term that emerged due to the exponential increase in the volume of data generated and processed in information systems. 'Big Data' refers to data that exceeds the capabilities of traditional relational databases and data warehouses. Due to the size and high rate of change, they require alternative methods of collection and processing.

In analyzing HR data, particularly useful methods include network structure analysis and content analysis. Network structure analysis (Social Network Analysis and Web Structure Mining) involves identifying connections between nodes in a network, distinguishing user groups, determining key nodes in the network, and analyzing the flow of information between these nodes. The primary goal of network structure analysis is to identify patterns in the processes being carried out and to determine employees who:

- condition the correctness of process execution and the achievement of set goals – they represent central nodes in the network,
- condition effective connections with other elements of the network – nodes that serve as integrators between dependent nodes,
- are poorly integrated or not integrated at all with other actors in the process – they represent isolated nodes in the network,
- form informal groups that influence the behaviors of other employees within the organization.

Network structure analysis enables the selection of individuals for task teams, the creation of effective communication channels, the identification of leaders and experts, the identification of relationship categories, and the determination and monitoring of information exchanged between team members.

Content analysis (content mining), on the other hand, involves extracting information from documents and websites. A specific case in the context of HR is the automatic analysis of CV content, speech recognition, content and statement evaluation, image and video analysis, enabling the hiring of the best candidate for a vacant position.

In HR processes, analyses such as employee loyalty analysis, new employee attraction studies, employee opinion surveys, burnout analysis, and the study of employee turnover causes and probabilities are also conducted. These analyses are made possible by access to new data and the development of new techniques for knowledge extrapolation from data (Buyck et al., 2016; Saradhi, Palshikar, 2011).

Artificial intelligence is revolutionizing the modern world. AI-based solutions, such as:

- chatbots and voicebots engaging in conversations with customers,
- virtual teachers personalizing learning paths,
- recommendation systems,
- search engines,
- object recognition programs, are present in virtually all areas of human life, not only in professional but also in personal spheres.

Organizations recognize numerous advantages in the application of artificial intelligence solutions, which are distinguished by their operational speed, continuity, and the reduction of the risk of errors. Furthermore, robotic systems are capable of functioning around the clock, 24 hours a day, 7 days a week. They do not experience illness, take leave, or suffer from challenging working conditions. Additionally, they do not express dissatisfaction nor present any demands. In this regard, it can be argued that they represent 'ideal' employees.

Artificial intelligence can be leveraged in human resource management across a diverse range of areas, including mitigating gender discrimination in recruitment processes, predicting employee turnover or profitability based on factors such as phone conversations, social media data, and internal databases. The development of HR applications capable of defining competency requirements for specific roles and identifying key traits to seek in candidate profiles represents a forthcoming advancement in the field (PwC, 2017). It is increasingly evident that administrative tasks of a routine nature will be automated, and many job roles will likely be enhanced through AI integration. The term AI, traditionally referring to artificial intelligence, has, in recent years, come to be interpreted as 'augmented intelligence.' This perspective underscores the augmentation and optimization of human labor, with the aim of enhancing and more effectively utilizing human potential (Singh, 2020). Such advancements may offer solutions to a longstanding challenge faced by employers – the identification, retention, and development of the most suitable employees, a challenge that is expected to intensify in the future.

Chatbots and virtual assistants are solutions based on artificial intelligence technologies, particularly Natural Language Processing (NLP), which enable automated and interactive communication with users. In the HR environment, their use is growing rapidly as they facilitate efficient knowledge management and the automation of processes related to employee support. HR chatbots serve as the first point of contact for employees with the HR department and perform various functions, including:

- providing answers to frequently asked questions (FAQ) – the chatbot can respond to inquiries regarding, for example, leave policies, internal procedures, benefits, or payroll schedules,
- supporting the onboarding process – new employees can ask questions about their first days at work, safety regulations, organizational structure, etc., which reduces the burden on the HR department and accelerates the onboarding process,
- reminders and notifications – the chatbot can automatically remind employees to complete performance evaluations, training sessions, or medical examinations,
- collecting feedback – the chatbot can conduct short satisfaction surveys or engagement assessments in a quick and unobtrusive manner,
- supporting recruitment processes – recruitment chatbots can conduct preliminary interviews with candidates, analyze resumes, and even schedule interview appointments, thus saving recruiters' time.

Virtual assistants, on the other hand, are more advanced versions of chatbots, often integrated with HRM and KMS systems, offering enhanced functionality:

- personalization of communication – they provide information tailored to individual employees, such as reminding them of their career development path or suggesting courses based on performance evaluations,
- access to organizational knowledge – by integrating with knowledge bases, the virtual assistant can 'extract' information from documents, procedures, and regulations, facilitating access to knowledge embedded in systems,
- decision support – they assist leaders and managers in analyzing HR data, for example, suggesting potential candidates for promotion or recommending retention strategies based on historical data.

Chatbots and virtual assistants are becoming an integral part of modern HR departments, supporting knowledge management and enhancing operational efficiency. Their effective implementation allows for the transformation of traditional HR into a model that is more data-driven, automated, and employee-experience focused.

Robotic Process Automation (RPA) is a business process automation technology that utilizes software, so-called software robots, to perform repetitive, rule-based tasks previously carried out manually by employees. RPA mimics user actions in the interfaces of information systems, such as data entry, copying information between applications, generating reports, or answering emails. It enables the transfer of routine, monotonous, rule-based tasks, previously executed solely by humans, to robots (Fersth et al., 2019; Sobczak, 2022). Software robots serve as digital collaborators and digital assistants to computer operators. Contemporary software robots represent an easy-to-use, digital workforce.

RPA can also be successfully applied to HR-related tasks that involve multiple systems. For example, the fact of hiring, transferring, or dismissing an employee can trigger processes in systems related to benefits management, payroll, and pensions. The RPA application can be programmed to automatically initiate these processes.

RPA often constitutes the first step toward intelligent automation, which integrates RPA with artificial intelligence technologies, machine learning, and natural language processing.

3. Research Results

3.1 Research Methodology

The research findings presented in this article constitute part of a broader study, the primary objective of which is to determine the role and potential of modern technologies in knowledge management within HR processes. The research design comprised two main components: interviews (qualitative research) and a survey (quantitative research). The interviews conducted with HR department employees aimed to identify the most significant technologies used in knowledge management in HR processes within contemporary organizations and to assess their potential. They also served as the basis for developing the survey questionnaire, an essential tool for conducting the main study. The goal of the survey was to examine the extent to which automation, robotization, artificial intelligence, and digitalization are applied in managing human resource processes in modern organizations; to assess the level of familiarity with modern information technologies used in knowledge management in HR processes among employees from various organizational departments—not limited to HR; and to evaluate their effectiveness, particularly by identifying their strengths and weaknesses. This article presents the key findings from the qualitative research phase.

The first stage of the study was planned to be conducted over a period of three months. The research commenced on January 7, 2025. The research sample was non-representative, and a purposive sampling method was employed. The following selection criteria were established: (1) respondents were required to be employees of HR departments; (2) only one respondent per organization was permitted; (3) the organization’s headquarters had to be located in an economically developed region—specifically, the most economically developed provinces in Poland, namely the Mazowieckie and Śląskie Voivodeships. Respondents were reached through various channels. During the designated period, a total of 25 interviews were successfully conducted.

The qualitative research was carried out using a questionnaire-based interview method. The questionnaire included nine core questions (presented in the following section of this article) and five demographic questions.

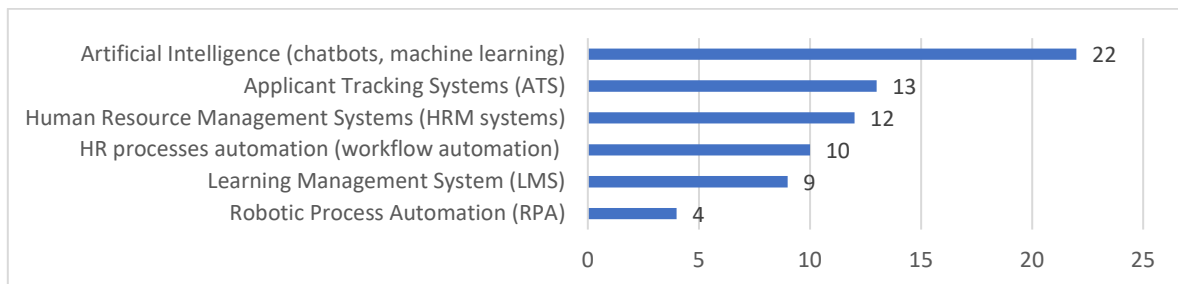
The demographic questions asked respondents about: (1) gender, (2) age, (3) type of position held within the HR department, (4) size of the organization, and (5) the organization's sector of activity. The study included 15 female and 10 male participants. Fifteen respondents were aged between 20 and 25 years, seven were between 31 and 49 years old, and three were aged between 26 and 30 years. Six respondents held managerial positions, while the remaining participants were non-managerial white-collar employees. The majority of respondents—thirteen individuals—represented large organizations. The remaining respondents were employed in medium-sized organizations (seven respondents), small organizations (one respondent), and microenterprises. The participants worked across a variety of sectors, including public administration, education, finance and banking, trade and e-commerce, information technology, employee outsourcing, industrial manufacturing, healthcare, and diverse service industries.

3.2 Results

During the interviews, respondents were asked the following questions:

- What modern technologies do you know that are useful in employee management?
- What modern technologies useful in employee management are currently implemented in the organization you work for?
- In your view, do these technologies contribute to improved knowledge management in HR?
- What benefits can result from their implementation?
- What are the main barriers to using modern technologies in HR?
- Which HR areas in your company are supported by modern technologies?
- In your view, should the organization you work for invest more in modern HR technologies?
- In your view, what additional technological functionalities would be most useful in HR?
- What are your greatest concerns related to the implementation of modern technologies in HR?

Respondents’ answers were categorized, which allowed for the identification of a group of modern technologies perceived as useful in employee management by HR practitioners. These technologies included: Artificial Intelligence (chatbots, machine learning), Applicant Tracking Systems (ATS), Human Resource Management Systems (HRM systems), HR processes automation (workflow automation), Learning Management System (LMS) and Process Automation (RPA) – Figure 1. One respondent indicated a lack of knowledge regarding HR-dedicated solutions that could be classified as modern technologies.



Source: Own study

Figure 1: Categorized responses of respondents to the question: What modern technologies do you know that are useful in employee management? N=25

All of the identified technologies are in use across surveyed organizations; however, not all of the studied companies implement them. Ten out of the 25 surveyed organizations do not utilize such solutions. This may be partially explained by the presence of small and micro-enterprises within the sample group; nevertheless, no

statistically significant relationship was found between the implementation of modern information technologies and organizational size within this sample. The extent of technology adoption also varied among organizations. The most frequently applied solutions included HR processes automation (workflow automation), reported by nine respondents, and Human Resource Management Systems (HRM systems), indicated by eight respondents. Less commonly used were Learning Management System (LMS) – cited by four respondents – as well as Robotic Process Automation (RPA), Artificial Intelligence (chatbots, machine learning), and Applicant Tracking Systems (ATS), each mentioned by three respondents.

The respondents generally agree that modern technologies enhance knowledge management within the HR domain—21 participants indicated “definitely yes” (9) or “rather yes” (12). The main benefits identified as resulting from the implementation of such technologies include: automation of repetitive tasks, facilitation of HR data analysis, improved efficiency of HR processes, faster access to information and better personalization of employee training and development – Figure 2.

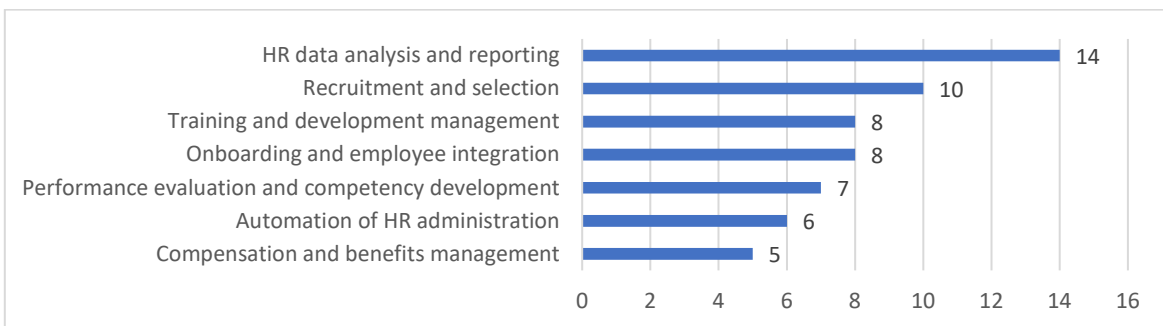


Source: Own study

Figure 2: Categorized responses of respondents to the question: What benefits can result from modern technologies implementation? N=25

The technological functionalities considered most beneficial for HR, as identified by respondents, include: monitoring employees’ knowledge levels; personalized career development plans; individualized training aligned with personal needs and development trajectories; the use of AI to measure employee engagement; prediction of burnout risk; automation of recruitment processes, including the generation of reports based on candidates’ CVs and publicly available online information, CV verification, recruitment chatbots, automation and optimization of routine and repetitive tasks such as email communication and thank-you messages after recruitment; enhancement of onboarding processes through personalized messages for specific employees; automation of performance evaluations; workforce scheduling; and broader automation of standard HR procedures. These functionalities are closely aligned with the previously indicated benefits.

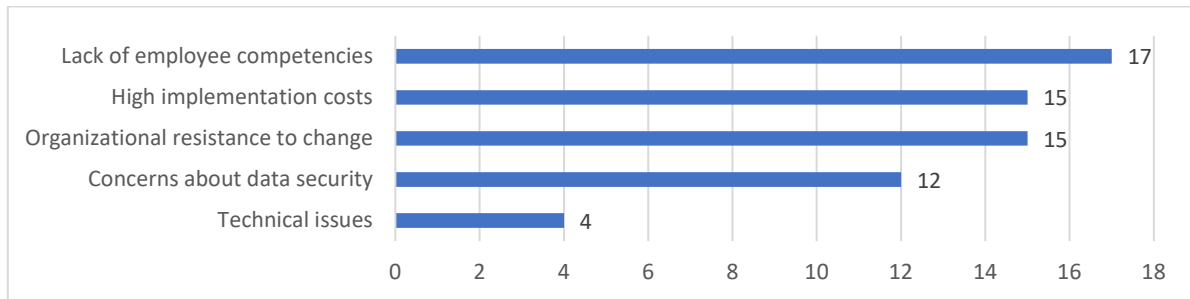
In the surveyed organizations, these technologies are applied across various HR domains. The areas identified in the study (within 15 organizations) include: HR data analysis and reporting, recruitment and selection, onboarding and employee integration, training and development management, performance evaluation and competency development, automation of HR administration and compensation and benefits management – Figure 3.



Source: Own study

Figure 3: Categorized responses of respondents to the question: Which HR areas in your company are supported by modern technologies? N=15

Fifteen out of 25 respondents believe that their organization should invest more heavily in modern HR technologies. Two respondents indicated that they do not see such a need, while the remaining respondents did not express a clear opinion on the matter. The main barriers to the adoption of these technologies, as identified by the respondents, include: lack of employee competencies, high implementation costs, organizational resistance to change, concerns about data security and technical issues – Figure 4. None of the respondents considered the lack of appropriate software tools on the market to be a barrier.



Source: Own study

Figure 4: Categorized responses of respondents to the question: What are the main barriers to using modern technologies in HR? N=25

Respondents were also asked to identify the greatest risks associated with the implementation of modern technologies in HR. The respondents highlighted the following threats: data security issues, such as data breaches or loss; a high risk of dehumanization; treating employees through the lens of metrics; lack of direct contact; employment limitations—the replacement of humans by machines, which could lead to increased unemployment and the disappearance of certain professions; software errors; high implementation costs; and resistance to new solutions from the older workforce. These concerns are strongly correlated with the identified barriers to implementation.

4. Conclusions and Discussion

The article addresses the role of modern technologies in knowledge management within HR processes, emphasizing their significance in building a competitive advantage for organizations in the digital era. The background illustrates how modern technologies are transforming the way knowledge is managed in HR—from manual procedures to integrated, digital environments that support employee development and operational efficiency. The effective implementation of ICT tools, Knowledge Management Systems (KMS), and Artificial Intelligence (AI) not only enhances the performance of HR departments but also fosters an organizational culture centered on continuous learning and knowledge sharing. The key HR processes related to knowledge include recruitment, onboarding, competency development, succession, and employee retention.

The foundation of digital transformation in HR is built upon information technologies that support the collection, processing, and utilization of knowledge within the personnel domain. The conducted qualitative research based on interviews with HR department employees enabled the identification of key technologies applied in organizational practice within Polish enterprises. The following technologies were identified: Artificial Intelligence (including chatbots and machine learning), Applicant Tracking Systems (ATS), Human Resource Management Systems (HRM), HR processes automation (workflow automation), Learning Management System (LMS), and Robotic Process Automation (RPA). The identified technologies align with those recognized as modern and relevant in the academic literature on the subject.

The article also outlines the functionality and utility of modern technologies in the HR domain, as well as identifies the potential benefits and challenges associated with their implementation in organizational practice. The key benefits identified through the study include: the automation of repetitive tasks, facilitation of HR data analysis, improvement of HR processes efficiency, faster access to information, and enhanced personalization of employee training and development. The research findings confirm the growing importance of technology in the digital transformation of HR functions. The highlighted functionalities align with those recognized in the relevant academic literature.

The study is not of a representative nature. However, as noted, it constitutes the first stage of a broader research project aimed at identifying the role and potential of modern technologies in knowledge management within HR processes in contemporary organizations. The results presented herein served as the basis for developing a

research questionnaire to be used in the main quantitative survey. The objective of the main study is to examine the extent to which automation, robotization, artificial intelligence, and digitalization are applied in managing HR processes in modern organizations; to assess the level of familiarity with modern information technologies used in knowledge management within HR among employees; and to evaluate their effectiveness, with particular attention to identifying their strengths and weaknesses.

Ethics and AI declaration: The paper does not infringe the copyright of third parties. No relevant AI tools are used to develop this paper.

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