DOI 10.18.276/978-83-8419-053-1-20

28th European Conference on Artificial Intelligence (ECAI 2025)

THE FUTURE OF AI IN HRM. A CASE STUDY OF THE HR DECISION-MAKING

Karolina Drela[a], Anna Grabowska[b], Małgorzata Brojak-Trzaskowska[c], Alexandra Bousia[d]

[a] *University of Szczecin, Institute of Management, Poland*
[b] *Bydgoszcz University of Science and Technology, Faculty of Management, Poland*
[c] *University of Szczecin, Institute of Spatial Management and Socio-Economic Geography, Poland*
[d] *University of Thessaly, Department of Business Administration, Greece*

ABSTRACT

Purpose: *The purpose of the study was to identify whether companies are actually using artificial intelligence technology in HR departments in relation to the employee life cycle, and to present the possibilities of using artificial intelligence in HRM, in light of the available literature.*

Need for the study: *In the face of dynamic digital transformation and growing challenges in talent management, understanding how AI can transform HRM and HR decisions related to HR functions is becoming crucial for organizations looking to increase efficiency and competitiveness.*

Methodology: *The research methods used in this article include a critical analysis of the source literature, the method of diagnosis of the current state and prospects of the application of artificial intelligence in HRM and the method of synthesis with regard to the construction of conclusions in the theoretical and pragmatic spheres, as well as the analysis of primary data from interviews conducted three Polish companies and presented in the case study.*

Findings: *The analysis and evaluation conducted in the article showed that the implementation of AI in HRM can lead to increased efficiency in HR departments, improved employee and candidate experiences, and more strategic data-driven decision-making. This increases awareness of the potential of technology in improving HR functions and adapting to the challenges of the modern labour market. The future of HR functions using AI will be characterized by greater automation, better data-driven decisions, more personalized employee experiences and a strategic approach to talent management. Nevertheless, potential challenges related to algorithm bias, data privacy and employee acceptance of technology were also identified.*

Practical Implications: *The results obtained can help in planning HR functions and HR decisions, freeing HR professionals from routine tasks, allowing them to focus on more strategic initiatives and contributing to improving overall organizational performance and employee satisfaction. The problems associated with the under-utilization of AI in HRM remain a challenge for the future.*

Keywords: Human Resource Management; Human Resources; Artificial Intelligence; Organizations; Labour Market

Jel codes: J24; O31; O33; M54

Peer-review under responsibility of the scientific committee of 28th European Conference on Artificial Intelligence (ECAI 2025) and Intelligent Management Workshop.

1. INTRODUCTION

With the emergence of AI platforms such as ChatGPT and Google Gemini, the topic of artificial intelligence (AI) has also emerged in organizations. Whether working in a B2B or B2C organization, a start-up, a public institution or a multinational company, executives are thinking about how AI can help the company optimize operations.

Artificial intelligence is a solution that brings more and more benefits and reduces the responsibilities of HR departments. Today, in many companies, AI is responsible for, among other things, the creation of automated candidate databases, detailed analysis of submitted resumes, recording of working hours or posting job offers on multiple portals, and the use of new technologies allows to reduce the costs associated with recruitment and increase the efficiency of HR departments. It should be added that this is because HR departments have developed in a way that is driven by technology and the data that employees constantly provide to enhance their strategic role in the company. One of these technologies is artificial intelligence, treated as a science that aims to replicate aspects of human intelligence, such as learning, reasoning, perception, critical thinking, etc., using logic-driven computer programs (Villani, 2018). Another definition can also be provided, treating AI as the ability of a system to correctly understand input data, learn from it, and apply it to achieve specific goals and tasks through adaptive implementation (Kaplan & Haenlein, 2019). Therefore, human intelligence is enhanced by AI because it frees up workers to perform tasks that can be automated, thus enabling them to develop skills and knowledge in a more productive way (Sanyaolu & Atsaboghena, 2022).

Organizations are undergoing significant digital upheaval, with an apparent shift toward integrating AI into decision-making processes to ensure business success and growth (Varsha, 2023). Companies are being forced to improve their organizational functioning and develop the skills of their human resources to achieve optimal company performance (Wolor et al., 2020). Therefore, companies have begun to recognize the inevitability and importance of AI in human resource management in order to survive in a rapidly changing environment and survive amidst intense competition (Waheed et al., 2019). As AI has permeated almost all fields and gained much attention, researchers are now focusing on constructing strategic human resource management practices supported by AI technology (Wang et al., 2020). Organizations around the world are facing the challenges of cutting costs and saving time, and the combination of Internet-like technologies, machine learning and artificial intelligence in the management process as a strategic element can help solve these challenges (Hemalatha et al., 2021). Undoubtedly, artificial intelligence has a promising future in human resource management. However, it should be noted that integrating artificial intelligence into HR processes comes with challenges such as this, that artificial intelligence can only operate efficiently like a human if it receives high-quality data. There is also a risk that confidential documents and procedures/policies shared by organizations, could be misused.

In the face of dynamic digital transformation and growing challenges in talent management, understanding how AI can transform HRM and HR decisions related to HR functions is becoming crucial for organizations looking to increase efficiency and competitiveness. Therefore, human resource management (HRM) is facing new challenges that need to be solved while ensuring optimal growth and development of the organization. They have begun to wonder in which HR decisions, AI will improve the work of Human Resources (HR) departments. Can artificial intelligence in HRM bring numerous benefits, for example, in improved employee experience, increased productivity, reduced recruiting costs, faster problem solving and decision making, or reduced routine duties? This study identifies the application of technologies and artificial intelligence in HR departments in relation to the employee life cycle: recruitment and selection, induction process, employee retention, compensation management, overall employee management. The purpose of the article is also to present the possibilities of using technology based on artificial intelligence in HRM in light of the available literature. Thus, two research questions are posed: how does AI support HR professionals in practice, and what are the current limitations of this technology and prospects for its development in HRM?

Despite these challenges with artificial intelligence, companies are showing interest and making significant efforts to integrate artificial intelligence into HR functions, as the benefits of using artificial intelligence in HR outweigh its challenges (George & Thomas, 2019). Organizations can enjoy the benefits and potential of artificial intelligence if they are willing to transform their employees to work

efficiently with intelligent machines. This process will undoubtedly take time, but the benefits will be very large (Mathipriya et al., 2019).

2. LITERATURE REVIEW

2.1. Application of Artificial Intelligence in HRM

Digitization, artificial intelligence and automation of business processes arouse much excitement in society. It is also a topic that is being addressed today by a great number of researchers and human resource management specialists. There is much debate over the ethical layer of the solutions used. On the one hand, companies see new technologies as a panacea for the operational problems they face every day. They see them as an opportunity to increase business efficiency, save money, increase the productivity of their employees. With technologies, they want to increase production, reduce prices. New technologies are responding to changes in the work environment and the challenges employers face today (Kohnova et al., 2019). Digitalization is having an impact on both employees and employers in the areas of new professions, competence development or forms of work, among others (Strzelczyk, 2019). On the other hand, others are concerned that the new technology will exclude certain professional groups, especially those in smaller localities with lower levels of education. Many fear that their work will be replaced, automated (Sohani et al., 2025). No doubt this will happen to repetitive, simple administrative jobs. On the other hand, many jobs will be enriched. Increasingly, the acronym AI, instead of artificial intelligence, is translated as augmented intelligence. This approach and concept of AI points to the enrichment, streamlining of human work, in order to better utilize human potential (Singh, 2020).

AI technologies have begun to develop consistently and gain a significant foothold in almost all fields, including medicine, engineering, agriculture, organizational management, tourism, transportation, etc. (Mintz & Brodie, 2019) and have entered both public and business environments (Haenlein & Kaplan, 2019).

Artificial intelligence is among the most influential technologies changing the labor market. Artificial intelligence systems are increasingly being used in the field of human resource management.

To address the topic of AI and its impact on HRM, it was decided to provide a definition of human resource management, which the authors will use throughout this paper. Human resource management is the adoption of specific functions and activities for the efficient and effective use of employees in an organization to achieve its goals, which include maximum satisfaction of key stakeholders and positive contribution to the environment. It includes the formulation, implementation and ongoing maintenance of strategies, policies, procedures, principles, practices and systems for strategic, participatory and sustainable management of employees (Opatha, 2021).

Analyzing the literature on the subject and the studies described therein (Zhai et al., 2024), it can be seen that artificial intelligence has a beneficial impact on the HRM field. This has been noted by, among others: Jia, Guo, Li and Chen (2018), Vivek and Yawalka (2019), George and Thomas (2019), and Garima, Vikram and Vinay (2020), who discussed the advantages of implementing artificial intelligence, throughout the employee lifecycle. Garima, Vikram and Vinay (2020) concluded that artificial intelligence replaces routine tasks in HR with less human intervention. Vivek and Yawalka (2019) noted how AI helps reduce workload and increase efficiency in the workplace.

AI is shaping the future of human resource management in many ways: from streamlining recruitment processes with predictive analytics to personalizing employee development programs with machine learning algorithms (Gigerenzer & Todd, 1999; Jia et al., 2018; Cappelli et al., 2019; Bankins & Formosa, 2020). It should be emphasized that in a process referred to as “algorithmic management” (Bankins et al., 2022), AI systems are used to evaluate candidates in the recruitment and selection process (Marr, 2018), assign jobs (Lee et al., 2015), provide training recommendations (Guenole & Feinzig, 2018) and, for example, terminate employee relationships (Kellogg et al., 2020).

On the positive side, artificial intelligence has the potential to revolutionize HRM by automating routine tasks such as resume screening and data entry (Atsalakis, 2014; Stone et al., 2015; Brynjofsson et al., 2017). What's more, AI-based predictive analytics can facilitate more accurate talent acquisition and workforce planning, ultimately leading to improved recruiting outcomes and reduced turnover rates (Stone et al., 2005; Dineen & Soltis, 2011; Dineen & Allen, 2013). AI can also enhance employee

engagement and development through personalized learning experiences and real-time feedback (Chapman et al., 2003; Orvis et al., 2011; Cleveland et al., 2015; Stone et al., 2015).

Jia, Guo, Li, and Chen (2018) found that most organizations are not fully ready to implement AI in their HR functions, and Vivek and Yawalka (2019) observed that it is difficult to find the right employees to operate AI tools, and artificial intelligence is limiting HR departments in decision-making as technology is apparently taking over this aspect. Nevertheless, it is important to recognize the potential drawbacks of artificial intelligence in HRM. Over-reliance on AI can inadvertently lead to bias in decision-making, as algorithms can perpetuate historical discrimination present in the data they are trained on (Li, 2019; Cheng & Hackett, 2019). In addition, depersonalizing HR processes through AI-based automation can undermine the human element, which is crucial to employee morale and well-being. There are concerns about the lack of privacy and security of sensitive data as HR departments handle confidential employee information (Piccoli et al., 2001; Johnson et al., 2008; Ritzer, 2011; Jeske & Santuzzi, 2015; Duggan et al., 2020; Braganza et al., 2021).

AI works in HRM through two modes of human-machine collaboration: augmentation and automation (Jarrahi, 2018; AlHarthi, 2025). When considering augmentation, it refers to AI's ability to work alongside humans by influencing HRM and is called “computerization of HR tasks”. Automation, on the other hand, is considered as replacing humans with machines and is called “automation of HR tasks” (Raisch & Krakowski, 2021). Rightly, however, Stein and Scholz (2020) proposed that HRM and automated management should be combined into the Human Resources Management and Automation Model (HARM), which can be considered the evolutionary direction of HRM.

The impact of AI on HR is a topic beyond the field of HRM due to its interdisciplinary nature. For example, the development of AI-based HR tools depends on advances in technical fields, while the implementations of such AI tools and the consequences of AI implementations rely on knowledge from the social sciences (Jangbahadur et al., 2025). Scientists from various disciplines have contributed to AI-HRM knowledge. For example, computer scientists have developed AI algorithms to solve HRM problems (e.g., Anandarajan, 2002; Blanchard & Henle, 2008). Economists have discussed the impact of AI on labor markets (Berg et al., 2018). Psychologists have found that the use of AI does not demotivate job candidates during recruitment (Van Esch et al., 2019), but can result in higher employee turnover (Brougham & Haar, 2020).

It is noted that AI can have negative consequences, such as eliminating jobs and increasing social inequality, but it can also provide benefits, such as improving or expanding jobs instead of replacing them (Vashishth et al., 2025). Certainly, AI will have a significant impact on the future of human resource management, and the application of AI to HRM has great potential (Malik, et al., 2020; Malik et al., 2021).

With increasing digitization, artificial intelligence is becoming more prevalent in HR management and HR information systems. AI integration includes tactical procedures such as recruitment, performance and employee satisfaction assessments, compensation and benefits analysis, best practices analysis, discipline management, and employee training and development systems (Votto et al., 2021).

Organizations are undergoing significant digital upheaval, with an apparent shift toward integrating AI into decision-making processes to ensure business success and growth (Varsha, 2023). Companies are forced to improve their organizational functioning and develop the skills of their human resources to achieve optimal company performance (Wolor et al., 2020). Therefore, companies have begun to recognize the inevitability and importance of AI in human resource management in order to survive in a rapidly changing environment and survive amidst intense competition (Waheed et al., 2019). As AI has permeated almost all fields and gained much attention, researchers are now focusing on constructing strategic human resource management practices supported by AI technology (Wang et al., 2020). Organizations around the world are facing the challenges of cutting costs and saving time, and the combination of Internet-like technologies, machine learning and artificial intelligence in the management process as a strategic element can help solve these challenges (Hemalatha et al., 2021). Undoubtedly, artificial intelligence has a promising future in human resource management. However, it should be noted that integrating AI into HR processes comes with challenges, such as the fact that AI can only operate efficiently like a human if it receives high-quality data. There is also the risk that confidential documents and procedures/policies shared by organizations, could be misused.

Despite these challenges with artificial intelligence, companies are showing interest and making significant efforts to integrate artificial intelligence into HR functions (Rabenu & Baruch, 2025), as the

benefits of using artificial intelligence in HR overshadow the observed challenges (George & Thomas, 2019). Organizations can enjoy the full benefits and potential of artificial intelligence if they are willing to transform their employees to work efficiently with intelligent machines. This process will undoubtedly take time, but the benefits will be very large (Mathipriya et al., 2019).

2.2. Artificial intelligence in data analysis for improved decisions in HR business strategy

Data analysis using artificial intelligence opens up new opportunities for companies to optimize their business strategies. Processing huge data sets in real time allows the identification of market trends that may escape traditional analysis methods. As a result, organizations can respond more quickly to changing market conditions, which is key to staying competitive.

Improving data analysis and decision-making in HR departments through AI is predicated on several factors, as shown in Table 1.

Table 1. Determinants of data analysis and decision-making in HR departments through AI

Factors	Characteristics of AI activities
Data availability and quality	AI needs the right quantity and quality of data to effectively analyze and generate valuable insights; HR departments collect a variety of data on employees, candidates, HR processes, etc. (e.g., HR data in applications, results of periodic evaluations, satisfaction surveys, online recruitment data); unifying and storing this data is key; it is also possible to expand databases with data from the external environment
Implement the right AI tools and technologies	The availability and implementation of AI-based HR analytics tools is essential; there are many algorithms and data analysis methods that are particularly useful in HR, such as clustering, classification, time series analysis, pattern detection, causal modeling
Digital and analytical competencies of HR professionals	HR professionals need to be digitally competent and capable of working with AI tools and interpreting analytical results; conferences for HR departments are increasingly focusing on AI, indicating a growing need to develop these competencies
Understanding business needs	HR professionals need to understand the organization's business needs in order to use AI to provide analysis and recommendations that contribute to strategic goals
Compliance with regulations and ethics	The acquisition and handling of employee data through AI must respect legal acts and employee rights, including data protection personal and privacy; ethical and responsible use of automated decision-making systems is important

Source: own elaboration.

To improve data analysis and decision-making by HR departments through AI, there is a need to move from an intuitive and experience-based to a more objective and evidence-based (data-driven) approach. Key aspects of this improvement include automation and efficiency. AI automates the collection, storage and analysis of large amounts of data, which significantly increases the efficiency of HR departments. This reduces administrative burdens and allows HR professionals to focus on more strategic tasks. Insightful analysis and pattern identification are related to the fact that AI excels at finding connections and patterns between any data, which can be difficult to capture with traditional methods. This makes it possible to identify the success factors of top managers, the drivers of errors, fraud and accidents, as well as patterns of employee engagement and exit risk. AI enables predictive analytics and forecasting to use big data to predict staffing needs and optimize hiring strategies. It allows predicting the success of an organization or the performance of employees or teams, as well as forecasting (short- and long-term) and supporting HRM problem-solving activities. Reducing subjectivity and bias, on the other hand, involves reducing subjectivity and using objective data when evaluating employees and candidates through the use of artificial intelligence, subject to appropriate programming and ethical considerations. On the other hand, support in strategic decision-making, through AI's analysis of data, results in the provision of valuable information and conclusions that can be used to improve decisions in HR departments' business strategy.

The implementation of AI in the data analysis process brings a number of benefits, which can be presented as follows:

1. Automation and efficiency: Artificial intelligence can automatically process and analyze data, reducing the need for manual work and minimizing the risk of errors.
2. Personalizing offers: With its ability to analyze customer behavior and preferences, AI enables the creation of more personalized offers, making them more effective. In the HR context, personalization can refer to development programs or career paths.
3. Trend forecasting: Using advanced predictive models, artificial intelligence can forecast future market trends, enabling companies to better plan and strategize. In the HR context, this can include, for example, forecasting employee turnover rates.

The application of artificial intelligence in data analysis not only increases the precision and speed of information processing, but also opens the door to a deeper understanding of the market. As a result, business decisions can be made on the basis of solid data, which significantly affects the efficiency and effectiveness of business strategy. As a result, companies that invest in the development of AI technologies gain a competitive advantage, which in today's fast-changing business world is priceless.

Predictive analytics is becoming a key tool in strategic talent management. AI systems analyze data from a variety of sources, including e-learning platforms, Customer Relationship Management (CRM) systems, project management tools and internal communication systems, to support HR decisions.

HR departments using AI can save a significant amount of budget, allowing reinvestment in employee development and innovation. In addition, AI provides valuable analytics that HR departments can use to appropriately manage human resources, monitor employee satisfaction and engagement, and assess exit risk. AI also makes it possible to continuously monitor competitive offerings in the labor market, allowing companies to respond quickly to changing employee needs.

In conclusion, artificial intelligence is a powerful tool for data analysis in HR departments, enabling more informed and strategic decision-making. Among other things, the use of AI in data analysis contributes to more efficient HR processes, a better understanding of market trends and employee needs, and potentially to cost reductions. It should be emphasized that AI-enabled analytics are playing an increasingly important role in strategic talent management, supporting recruitment, development and retention decisions. Despite the numerous benefits, it is important to keep in mind the ethical aspects of using data and ensuring data security.

2.3. Recruitment and selection

Automating and optimizing recruitment processes and screening candidates are among the key developments in which artificial intelligence is becoming increasingly important. Finding the right candidate for a given vacancy can be difficult, as you need to locate the right candidate from a pool of many talents on the job market and looking for work. Creating a list of candidates and reviewing resumes to find the right job candidate can be a daunting task (Garima et al., 2020). You should reach out to the right candidates while trying to fill positions as quickly as possible, as a vacancy can cost an organization a lot of money due to operational delays. Ensuring that the candidate has good experience and skills is key, as it increases the chances that the candidate will accept the offer.

Artificial intelligence can support recruitment processes in the following ways, through:

- preparation of job offers – AI technology is very quickly able to prepare content templates and concretized job offers,
- analyzing applications – processing huge amounts of information; this advantage can be used to accelerate the analysis of applicants' applications for a given position,
- automation of answers – a properly prepared chatbot sends automatic answers to the most frequently asked questions sent, for example, by job candidates.

By using AI tools, the recruitment process is much faster, while the selection of candidates itself is more efficient and precise. HR departments are using the developing AI to identify the best candidate for a vacancy in the recruitment process.

Many companies that have not yet implemented AI in the recruitment process are planning to do so in the near future, where they will be able to use artificial intelligence in the recruitment process to: create job ads, determine the specifics of the job, post job ads on multiple portals automatically, search for potential candidates on popular portals, e.g. Linkedin, schedule meetings, accurately screen candidates, accurately analyze resumes, upload screening tests, answer repetitive questions, analyze

data. The advantage of using artificial intelligence tools is that it reduces the burden on HR staff over the years and avoids subjective evaluations by recruiters.

Artificial intelligence can thus help speed up the hiring process, even as hiring requirements continue to grow (Skil AI, 2020). It can be involved in automating repetitive tasks by first working on large data sets and analyzing them to obtain employment trends. It can also be used to streamline the hiring process during recruitment. AI technology, such as chatbots, can be added to an organization's sites to engage visitors and increase conversations. This helps save time, as some of the work in recruiting, such as gathering candidate information, prequalifying candidates, scheduling meetings and chat times, and providing the candidate with answers to basic questions, can be done using chatbots (Skil AI, 2020; Aldulaimi et al., 2020). Machine learning techniques can be used to help interpret the large amount of data received and discover patterns not previously identified by the organization. AI technology can help screen resumes and identify suitable candidates for a position.

An organization's experience, skills, education level and many other interests are checked before accepting a candidate for a position using models trained in machine learning. This technology can help narrow down the list of all candidates by sorting those with the most relevant skills. It will only consider candidates based on qualifications and will help eliminate bias if programmed properly (Parveen & Palaniammal, 2019). AI can also perform background checks, such as checking candidates' social media profiles, to ensure that the selected candidate is the most qualified. This will save the recruiter time, ensure a fair hiring process and ensure the best candidate is hired. Most organizations find it difficult to engage and re-engage potential clients because it takes a lot of time. Companies usually do not receive responses from candidates after they have applied for a position or after an interview.

Software that incorporates artificial intelligence, such as Chabot, Applicant Tracking System (ATS) and Customer Relationship Management, helps provide real-time answers to all questions asked by candidates and provides updates on their progress. By implementing artificial intelligence in HRM, subjective criteria such as favoritism and nepotism are less likely to play a role in the recruitment and selection process of potential candidates (Tewari & Pant, 2020). Artificial intelligence can also be used to draft and send personalized correspondence to potential candidates.

In addition, artificial intelligence can analyze conversion rates, that is, measure how many applications lead to interviews, making it possible to identify the most effective strategies for reaching candidates, both during and after the recruitment process. This kind of optimization helps streamline the talent acquisition process and increase efficiency with each new hire.

However, it is also important to note the limitations and need to preserve the human aspect in recruitment. The final hiring decision and the conduct of subsequent recruitment stages still belongs to humans. It is also stressed that AI is meant to support, not replace, human work. In addition, it is important to keep in mind potential AI errors (hallucinations) and the need to verify candidates' knowledge of AI during recruitment interviews.

Artificial intelligence is revolutionizing the way organizations approach human resource management. For example, automating selection processes allows for faster and more efficient screening (selection) of candidates, which is crucial in a dynamically changing business environment. Thanks to advanced algorithms, it is possible to more accurately match the competencies of applicants (applicants), with the requirements of the job, which significantly affects in HRM the quality of the recruitment process.

In summary, AI is transforming recruiting by automating and optimizing processes, streamlining selection, using chatbots, personalizing communications with candidates, and analyzing data to increase efficiency. Despite the many benefits, it is crucial to balance AI's capabilities with the indispensable role of HR professionals and human assessment.

2.4. Onboarding

Once a new employee is hired, the induction process begins. Artificial intelligence in HR can greatly streamline this process by sending employees automatic reminders about missing documents or uncompleted tasks. It can also support employees in completing these tasks correctly, such as filling out forms, to reduce additional questions and correspondence. This makes the implementation process faster, more efficient and less stressful for both employees and HR.

Onboarding is one of the most important stages in an employee's path within an organization, but it traditionally comes with numerous challenges. For many companies, it is a time-consuming process,

and the lack of standardized procedures often leads to mismatched expectations and inefficiencies. As the job market grows and turnover increases, employees expect a better onboarding experience - one that is simpler, more intuitive and tailored to their individual needs. The reality, however, is that many employers are failing to keep up with these changes, which can affect their reputations and cause a decline in new employee engagement. This could represent a breakthrough, reducing implementation time and enabling a more fully personalized experience for new employees.

Various works on AI in HRM refer to onboarding. For example, Prikshat et al. (2021) focus on how to promote employee adoption of AI applications, while Votto et al. (2021) illustrate possible applications of AI applications in onboarding, such as job tracking or training analysis. In related work on using AI to improve the employee experience, most of the focus has been on chatbots. Thus, Meyer von Wolff et al. (2020) suggested using chatbots only to answer newcomers' questions.

Artificial intelligence significantly affects the employee deployment process, streamlining it and making it more efficient (Babic, 2021). In practice, AI supports HR professionals and new employees in a number of ways:

- automation of routine tasks: AI can send automatic reminders to employees about missing documents or unperformed tasks; it helps them perform these tasks correctly, such as by assisting them in filling out forms, which reduces the number of additional questions and correspondence; with AI, information flow and document delivery can be automated,
- streamlining access to resources: AI enables automatic transfer of access to important platforms, training and other specific company resources; new employees can get the necessary tools and information to get started faster,
- information support and problem solving: By automating contact with the HR department and finding answers to frequently asked questions, AI provides new employees with quick support and eliminates the delays associated with waiting for an answer from an HR specialist,
- personalization of the implementation process: AI allows the creation of interactive quizzes, tests, training exercises, scorecards or an automatic reminder system tailored to specific positions and the needs of new employees,
- monitoring progress and identifying needs: the HR department, thanks to AI, has a constant view of data on the deployment process, which allows it to assess the speed of new employees and implement possible assistance when needed; AI can track the cycle of employee development and reduce the need to control the timing of mandatory training,
- reduced deployment time: the use of AI contributes to reducing the deployment time of new employees and ensures that all the steps involved in preparing their workplace will be ready on time; the deployment process becomes faster, more efficient and less stressful for both employees and the HR department.

AI automates many routine and time-consuming onboarding tasks. It streamlines the flow of information and access to resources. AI makes the process more interactive and personalized. HR professionals gain tools to monitor the progress of new employees and respond quickly to their needs. Ultimately, AI contributes to reduced deployment time and increased efficiency.

In the future, AI may further revolutionize the onboarding process, becoming a more intelligent and proactive assistant for both new hires and HR. As such, the trends presented in Table 2 can be expected.

Table 2. The future of using AI in employee adaptation

Trend	Characteristics
Hyper-personalization	AI systems will be able to create highly personalized onboarding paths based on each new employee's role, skills, learning style and preferences; AI can analyze data on existing employees in similar positions to provide the most relatable information and tasks
Virtual assistants and AI mentors	More advanced AI-based chatbots and virtual assistants will be able to answer more complex questions, provide guidance and act as virtual mentors, guiding new employees through their first weeks and months on the job; they can also proactively provide information and reminders about important tasks

Integration with immersive technologies	AI can work with virtual (VR) and augmented (AR) reality to create immersive onboarding experiences, such as virtual office tours, getting to know teams and interactive job training
Sentiment analysis and early detection of problems	AI systems will be able to analyze new employees' communications and interactions (e.g., in internal communication systems) to detect potential problems early on, such as feelings of confusion, lack of integration into the team, or difficulty with tasks, allowing HR to proactively offer support (rapid intervention and provision of support)
Automatic networking	AI can suggest new employees to new contacts in the organization based on roles, projects and interests, making it easier to integrate into the team and build relationships
Continuous evaluation and optimization of onboarding in real time	AI will be able to continuously monitor the progress and engagement of new employees, providing HR with real-time data on the effectiveness of the onboarding process and areas for improvement

Source: own elaboration.

Many studies highlight the growing role of AI in HRM, including onboarding processes. The research indicates that most HR leaders plan to increase their use of AI in at least one area of HR in the coming months, which includes onboarding new employees. The future of onboarding using AI promises to be more personalized, interactive and effective, with AI acting as an intelligent assistant to support new employees at every stage of their adaptation in the organization. Employee onboarding conducted using AI tools thus ensures that the employee is familiar with all the most important information.

2.5. Impact of AI on other personnel functions

In the context of HR, AI refers to the use of artificial intelligence to optimize processes to support an organization. For example, talent management support relies on the fact that AI can support the best employees, can be used to attract the most suitable candidates, and match employees' skills, competencies and personality traits to positions. It can also assist in planning career paths. It is also helpful in detecting informal structures and flows through AI-assisted analysis of HR data, which can identify network nodes, key individuals, user groups and information flows in an organization. In terms of personalizing the employee experience, AI makes it possible to customize development programs and career paths, increasing employee engagement and satisfaction.

As noted above, the implementation of AI solutions in human resource management is not limited to the recruitment process. These systems also support the development of employees by monitoring their progress, including by analyzing training needs and personalizing career paths. As a result, employers can not only retain the best talent in their teams, but also effectively support their professional development. The impact of using AI in HR, is shown in Table 3.

Table 3. The future of using AI in employee adaptation

Functions of HRM	**Using AI in Human Resources**
	The entire personnel cycle
HR in HR decisions using AI and the work of the HR department	• HR processes will begin to work more efficiently, be transparent and effectively attract talent to your organization, • real savings: lower costs associated with HR tasks performed by employees, • efficiency: automation of repetitive HR tasks and less risk of errors, • possible joint integration of HR systems with other tools: possibility to reuse data from all systems, • clear task statuses for different departments/divisions, • automation of data entry into HR and financial systems, • automation of account creation and authorization in IT systems, • supporting managers in managing the team, improving communication with the HR department, • employee self-service, support for employee mobility and remote working.
Employee records	• e-file: automatic collection of documents within an employee's e-file,

	• meeting legal regulations and reducing the cost of storing and handling employee records, • constant and quick access to documents, • security, confidentiality, integrity, availability, accountability.
Register of contracts	• automation of contract preparation based on data, for example, from previous recruitment stages, • generation of a contract document based on the template in force in the company, • integration with systems providing electronic signatures, • monitoring and reporting on terms, types of contracts, terms of employment, • creation of a secure digital archive of contracts, • reduce contract storage costs, • gain better control over contract expiration dates.
Time records	• provide employees with an easy and intuitive platform for time reporting • improve communication with managers and support them in managing their team
Vacations and business trips	• streamlining the process of vacation request notification and approval: the supervisor can verify the date of leave based on the days off of team members, automatic notification of the HR department and setting up a replacement, • accounting for the cost of business trips using a dedicated program/platform..
Managing remote workers	• thanks to applications related to timekeeping, task management or mailroom, you can effectively monitor the tasks that the team is currently performing, • acilitating collaboration outside the office.
Performance management	• create performance management reports based on analysis of a variety of data, • ability to identify areas of inefficiency and help reduce burnout.
Keeping employees engaged	• analyzing data to monitor employee engagement and identify exit risks, • gathering feedback from employees and increasing their engagement through regular surveys and data analysis.
Company culture	• analyze team interactions to identify disruptions in workflow and promote positive interactions,
Planning	• using big data to predict staffing needs and optimize hiring strategies
Recruitment and selection	• automation and optimization of recruitment processesstreamlining the recruitment process, using a dedicated application to help handle and monitor the entire recruitment process, • using a platform that will help process candidate data securely.
Onboarding	• reducing the time to deploy new employees, • all activities related to the preparation of the workplace of new employees prepared on time, • monitoring the employee's progress as part of the onboarding process, • imely completion of onboarding tasks.
Salaries	• payroll processing, allowing employees to manage their financial data themselves, • ensure near 100% accuracy and minimize the risk of payment errors, • managing the employee bonus process with, for example, an app that collects key information in one place and will allow sensitive data to be processed securely.
Evaluation employee	• access to employment history, • effective assessment of employee competence and development, • comprehensive support of the process of periodic evaluation of employees, • tailoring, for example, the application to the individual needs of a given organization, so that the competence assessment is carried out efficiently and effectively.

Employee development and training	• personalizing the employee experience, • customizing career paths and training programs to meet individual employee needs, • tracking the cycle of employee development, reducing the control of the timing of mandatory.
Offboarding of employees	• notifications of ending contracts, • access to the employee's employment history, • automation of locking accounts and revoking privileges when an employee leaves, • monitoring the return of assigned equipment.

Source: own elaboration.

In the future, AI will play an even greater role in HR functions, becoming a more intelligent and proactive tool. Further hyperpersonalization, development of virtual HR assistants, integration with immersive technologies, advanced sentiment analysis and proactive support for employees can be expected. AI will also support continuous evaluation and optimization of all HR processes.

In summary, AI is transforming HR functions, offering tools for efficiency, personalization and data-driven decision-making. The key, however, is to implement these technologies responsibly, taking ethical considerations into account and balancing automation with the irreplaceable human factor.

3. METHODOLOGY

3.1. Scope

At the stage of conceptualization of the study, the research problem and objectives were formulated adequately to the main research subject of interest included in the article. The paper uses the research methodology used in the social sciences, especially the methods, techniques and instruments of qualitative research of a universal nature, including:

- the method of analysis, especially document analysis, i.e., critical analysis of the literature on the subject (compact and periodical), reference materials, industry reports and relevant Internet sources,
- a method for diagnosing the current state and prospects of applying artificial intelligence to human resource management,
- synthesis method with regard to the construction of conclusions in the theoretical and pragmatic spheres.

In the applied research approach, in addition to the determination of the research plan and the selection of appropriate research methods and techniques, the stage of analysis, interpretation and verification of the collected research material was included, as well as implicitly the stage of formulating constructive conclusions and presenting the results of the study. The article also conducts a deductive analysis of the situation in HR departments in Polish companies, based on the research conducted, taking into account the impact of artificial intelligence on HRM-related decisions.

The main objective of this study was to identify:

- whether companies are actually using artificial intelligence technology in HR departments in relation to the employee life cycle: recruitment and selection, induction process, employee retention, compensation management, overall employee management
- to present the possibilities of using artificial intelligence-based technology in HRM, in light of the available literature.

The main objective of this study was to identify whether companies are actually using artificial intelligence technology in HR departments in relation to the employee life cycle: recruitment and selection, induction process, employee retention, compensation management, overall employee management, and to present the possibilities of using artificial intelligence-based technology in HRM, in light of the available literature. To this end, a literature study and inference based on a case study were used. The timeframe of the research questions covers the period from 2020 to 2025.

3.2. Methodology & data description

The research presented in this paper contributes to a better understanding of the gap in the essence and role of artificial intelligence technologies in HR departments in relation to the employee lifecycle, and in particular the use of AI-based technologies in HRM.

This study was based on both secondary and primary data obtained from interviews. The stages of the research process included:

1. To assess the current state of knowledge on the use of AI-based technology in HRM, with a focus on AI and HRM, HR departments' decisions related to the use of AI, Application of Artificial Intelligence in HRM and the employee life cycle (including in HR data analysis, recruitment and selection, employee adaptation and other HR functions). The study focuses on analyzing the literature related to AI, HRM and HR function to answer specific research questions and extract important elements from the literature related to these three areas. To the authors' knowledge, research in this area is still inadequate, as shown by the literature review conducted between January and March 2025. For this purpose, source literature and data were collected from available sources and websites. A review of both Polish and foreign literature was conducted. Completion of this stage made it possible to present the possibilities of using AI in HRM in light of the available literature.

2. Conduct a pilot study, in the form of interviews in 3 medium-sized enterprises in the Kujawsko-Pomorskie Voivodeship in Poland, implemented from February to March 2025. The results of the research are presented in the case study. The implementation of this stage served to prove that companies want to use AI in HRM. It was shown that artificial intelligence supports HR professionals, but to a limited extent. Companies want to use AI more extensively because they see that automation speeds up processes and improves the efficiency of day-to-day work and supports HR decisions, and that all the companies surveyed actually use AI in HRM. The survey also identified the limitations of AI technology in its use in HRM and the prospects for its development in the surveyed organizations, and confirmed that in practice AI supports HR professionals.

3.3. Participants

The pilot study involved interviews with 3 people representing the HR department of the companies surveyed, ranging in age from 35 to 53. Two of the respondents were men, one was a woman. They were experts in their field, holding managerial positions. In the surveyed companies, 2 participants had worked since graduation, for one respondent it was the third job. The participants in the study had a university degree in economics. The sample selection for the interviews was purposive. The number of the sample was 5 interviews, but two respondents did not agree to be interviewed, excusing themselves with too much workload. Two HR Directors and one HR Manager participated in the survey. All respondents agreed to participate in the study. They were informed that the survey would be anonymous.

Each interview was recorded and, after transcription, removed from the recorder. The interviewer asked one question each time, and after obtaining an answer, asked a second question. He did not prompt the respondents or suggest answers. All those who provided answers consented to the recording and use of their answers in the article. Then, the interviews were coded. The case study presents the respondents' answers.

Due to time constraints, the authors did not conduct research in a larger number of companies. They did not use any other European market for research than the market of Polish companies. In the future, the authors intend to deepen and expand the research.

3.4. Procedure

Potential participants were invited to take part in the study, through a telephone interview that took place in the first week of January 2025. Three interviews were conducted with HR managers at three medium-sized companies in the Kuyavian-Pomeranian region. The companies were selected purposively, based on the assumption that these organizations declared on their websites that employees are the most valuable resource for the company. The interviews took place stationary. For security and RODO reasons, it was decided not to present by name the respondents and the names of the companies where the interviews were conducted. Before the interviews began, participants were informed of the anonymity of the study by giving their consent. The companies were named Company X, Company Y and Company Z.

The directors and HR manager were asked to answer the following questions:

Question 1: Has/will your company introduce artificial intelligence technologies in HRM between 2020 and 2025? If it has introduced, which ones and what do they consist of? If not, why and does it want to introduce AI into HR tasks in the future - to what HR functions?

Question 2: Can you identify the limitations of AI technology in use in HRM in your company and the prospects for its development?

The results of these questions are presented later in the article. An HR analysis of three case studies was carried out to identify issues related to the application of AI in HRM. The objective of this study was achieved and the research questions were verified based on the results of the literature analysis and empirical study.

Some sections of the paper are theoretical and review in nature, presenting new approaches to human resource management in the context of modern technology, employment policy, HRM, challenges and HR functions, and presenting concepts and trends in HRM, without describing specific empirical studies.

4. RESULTS

4.1. AI in Human Resources Management – case study 1

The company under study is located in the Kujawsko-Pomorskie Voivodeship in Poland. It is an organization that creates smart homes and uses modern technology, including AI, in human resource management. During an interview with the HR director, the respondent presented specific ways in which technology is integrated into its HR operations.

The first HR function that was discussed was recruitment and selection. Company X conducts its recruitment and selection process remotely, posting job advertisements on specialized online portals. The HR team, working in Germany, had to learn to identify the most suitable sources for sourcing candidates in Poland. The HR director stressed that the company is actively using AI tools for resume analysis and pre-selection. The company is considering other solutions to streamline and speed up the recruitment process and reach the best talent.

1/3 of the surveyed company's employees work online, so consideration was given to managing remote workers. Due to remote work, the company faces challenges in managing the team. The HR team uses modern communication tools to stay in touch and collaborate. The company's software has been improved due to ideas suggested by co-workers, suggesting the use of platforms to collaborate and exchange ideas. In the context of AI, Company X could probably use tools to monitor remote employee engagement and analyze communication patterns to identify potential problems.

When it comes to creating an organizational culture, the HR team plays a key role in creating HR policies to contribute to the development of the company. It works with management to develop leadership and create and develop human resources. In the context of modern technology, Company X uses AI tools to analyze employee feedback and identify areas for improvement in organizational culture.

The process of parting with employees (Exit Interview) is carried out through modern technology. Exit interviews are conducted via video conferencing or online surveys. It is conceivable that analysis of the data from these surveys could be aided by AI to identify reasons for exits and potential areas for improvement in human resource management.

Company X's HR team notes the risks of work-life balance in remote work. The company also offers consultations with an external organizational psychologist who cares about employees' psychological well-being. In the future, Company X would like to use AI tools to monitor burnout rates based on analysis of employee activity patterns (with privacy) and proactively offer support. In conclusion, the surveyed organization cares about work-life balance.

Company X, which creates smart homes, is an example of a company that puts into practice the use of modern technologies, including digitization and online communication tools, in various aspects of human resources management, especially in the context of remote work and recruitment and parting processes. The overall context indicates awareness of the potential of technology in improving HR functions and adapting to the challenges of the modern labor market. Company X focuses on remote

workforce management, the use of technology in recruitment and selection processes (indirectly), and taking care of employee well-being in remote environments.

4.2. AI in Human Resources Management – case study 2

Another company under study was Poland's Company Y, also located in the Kujawsko-Pomorskie region of Poland. It is an organization that creates intelligent homes and uses modern technologies, including AI, in human resource management. During an interview with the HR director, the interviewee presented specific ways in which technology is integrated into its HR operations.

Company Y is using technology in HR to innovatively assess and develop competencies, including through the use of game-based assessment. They use the Digital Fitness Assessment learning application. This shows that Company Y, in practice, has implemented technology-assisted gamification, which can be considered a form of using advanced algorithms and data to assess the competencies of candidates or employees. The HR manager recognized that the organization could make better use of artificial intelligence in the HR process, so he and his team of HR specialists, developed solutions that they intend to present to the company's Board of Directors.

Other AI solutions in HR that the HR Department wants to propose to the Y Company's Board of Directors are:

1. Support in recruitment and selection using AI.
   - resume analysis and candidate preselection: Company Y could use AI to automatically scan and analyze resumes to more quickly select candidates who meet key criteria, saving recruiters time,
   - recruitment chatbots: implementation of AI-based chatbots on the company's website under the 'jobs' tab, which could answer frequently asked questions from candidates, collect preliminary information and engage potential employees,
   - talent search: AI could support recruiters in identifying potential candidates on platforms such as LinkedIn, expanding the talent pool,
   - analyzing recruitment metrics: AI could analyze data from recruitment processes to identify the most effective sources of candidates, as well as optimize recruitment strategies.
2. In the area of development and training.
   - personalized development paths: AI could analyze data on employees' competencies, job performance and career goals to create individual development plans and recommend personalized training,
   - identifying skills gaps: AI could analyze employee skill data against job requirements and organizational goals, identifying areas where additional training is needed,
   - training recommendation systems: AI could recommend courses and training materials to employees based on their role, skills and progress to date.
3. In performance management and engagement.
   - employee opinion analysis: AI could analyze data from employee surveys, comments and other sources of feedback to identify trends, sentiment and areas identified for improvement in the organization,
   - early detection of employee departure risk: AI could analyze employee data (e.g., absenteeism, interactions, performance ratings) to identify signals indicating potential departure risk, enabling HR to take retention actions,
   - performance evaluation support: AI could analyze performance data and provide objective information to support employee evaluation processes, albeit balanced with human judgment.
4. In optimizing HR processes.
   - automation of routine tasks: AI could automate repetitive administrative tasks, such as processing documents, managing employee data, or responding to standard inquiries (e.g., using internal chatbots),
   - onboarding support: AI could automate part of the onboarding process for new employees, providing them with necessary information, reminders and training materials.

The implemented activities in HR using artificial intelligence mentioned by the Company Y respondent have the potential to extend to other HR functions if the company's Board of Directors agrees to use AI in the proposed activities. Implementing these AI solutions could help Company Y further improve the efficiency of the HR department, improve the employee and candidate experience, and

make more strategic data-driven decisions. However, it is important to keep in mind the ethical aspects of using AI, protecting personal data and balancing automation with the human factor.

4.3. AI in Human Resources Management – case study 3

Company Z is a mid-sized technology company operating in a dynamic sector with high competition for talent. The HR director interviewed noted that in the face of increasing challenges in recruitment, retention and the need to continuously improve employees' skills, Company Z's management made a strategic decision to invest significantly in AI-based technologies in the HR department. The goal of this decision was to automate routine tasks, use data analysis to make more strategic decisions, and improve overall HR efficiency. As part of this initiative, a number of AI-based tools were implemented, including intelligent recruiting systems, AI-based performance management platforms, chatbots, and employee sentiment analysis tools and predictive exit risk analysis systems, among others.

A survey participant highlighted that intelligent recruiting systems are associated at Company Z with the use of machine learning algorithms to analyze resumes and conduct initial assessments of candidates and predict their fit with the organizational culture. AI-based performance management platforms have been implemented, offering continuous feedback, tracking employee progress, and identifying areas for development. Also, HR chatbots began to be used, providing employees with instant answers to frequently asked questions about HR policies and benefits and procedures. At Enterprise Y, it decided to introduce employee sentiment analysis tools that use natural language processing (NLP) to analyze feedback from employee surveys and other sources to identify trends and potential engagement issues.

Predictive exit risk analysis systems have also been introduced. These are designed to analyze employee data to identify those with a high probability of quitting and enable proactive retention efforts.

The survey participant stressed that Company Z has no plans to introduce new solutions using AI in HR functions in the near future, unless the development of technology and techniques and the actions of competitors require it.

The HR director of Company Z, listed the results in the area of HR decision-making, thanks to the use of AI. And they are:

- in performance management - AI-based platforms have delivered more of both in recruiting – intelligent recruiting systems have significantly accelerated the candidate selection process, identifying individuals with desired qualifications more quickly and efficiently; predictive analysis of candidate match potential has reduced the number of misguided hires; however, there have also been concerns about potential algorithmic biases and the need to ensure diversity among candidates,
- in terms of performance management – AI-based platforms have provided more objective and continuous assessments of employee performance, based on data and not just on managers' subjective opinions; identification of areas in need of development has become more precise, making it possible to create personalized development paths; nevertheless, employees have expressed some discomfort with continuous monitoring, raising questions about privacy and trust,
- in terms of employee engagement –HR chatbots improved the accessibility of HR information to employees, which contributed to their satisfaction with the service; sentiment analysis tools provided valuable information about potential problems and areas of dissatisfaction, enabling HR to take proactive action; however, the limitations of chatbots in solving complex problems required maintaining a strong role for human HR personnel,
- in terms of employee retention – departure risk prediction systems made it possible to identify employees at risk of resignation, allowing targeted retention measures to be implemented; decisions to offer raises, promotions or additional benefits were more data-driven, making them more effective; however, ethical concerns were raised about the privacy of the data used to predict departure risk.

At the end of the interview, the Respondent summarized the activities being implemented at Enterprise Y. On the one hand, AI offers significant opportunities to increase the efficiency, objectivity and strategic nature of the HR function through automation, data analysis and the provision of predictive insights. Implementing intelligent recruiting systems, AI-based performance management platforms, HR chatbots and sentiment analysis tools can help optimize HR processes, improve employee engagement and make more informed talent decisions. On the other hand, implementing AI in HR also poses significant ethical, technical and organizational challenges. Concerns about algorithm bias, data privacy, excessive employee monitoring and technological limitations must be proactively addressed to

ensure AI is used fairly, ethically and effectively in HR decisions. The concept of the 5P (Philosophy, Policies, Programs, Practices, and Processes) model can provide a useful strategic framework for companies to optimize the use of AI in HRM. Defining an organization's philosophy toward the technology, establishing clear policies for AI integration, implementing appropriate programs and practices, and optimizing processes using AI can ensure that the technology is a strategic asset with HR goals and supporting the success of the organization.

The director added that the future of AI in HR decisions in organizations like Enterprise Y looks promising, but requires careful management. AI has the potential to revolutionize traditional HR practices, making them more effective, data-driven and strategic. Therefore, fully realizing this potential requires a conscious approach to ethical, technical and organizational challenges, as well as continuous monitoring and adaptation of implemented AI solutions. Organizations that can effectively integrate AI with human expertise and strategic thinking in HR will be better prepared to build an engaged, productive and competitive workforce in the digital age.

4.4. Limitations of AI technology in use in HRM and prospects for its development

Artificial intelligence is revolutionizing many fields, and human resource management is no exception. Given the interviews and responses to identifying limitations of the technology, it is important to emphasize that AI technologies offer promising opportunities to automate processes, analyze data and improve the efficiency of HR departments. But the implementation of AI in HRM also comes with a number of significant limitations that must be considered in order to realize the full potential of the technology while minimizing potential negative impacts.

The use of AI in HRM faces various limitations, which can be divided into several key categories. First, related to the lack of understanding of human nuances and emotional intelligence. One of the fundamental limitations of AI is its limited understanding of the complexity of human emotions, intentions and situational context. AI systems operate on data and algorithms, making it difficult for them to interpret subtle non-verbal cues, empathy or intuition-based assessments, which are crucial in many aspects of HRM, such as conflict resolution, assessing a candidate's cultural fit or providing emotional support to employees.

Second, there are risks associated with data and algorithms. The effectiveness of AI largely depends on the quality, objectivity and representativeness of the data on which it is trained. If the data is incomplete, erroneous, biased or inadequately secured, AI systems can generate incorrect conclusions, perpetuate existing biases or violate employee privacy. There is also a risk of misuse of confidential data shared with AI systems. Moreover, AI can sometimes generate completely made-up information (‘hallucinations’) or make mistakes, even in simple calculations.

Ethical and privacy challenges are another category. The use of AI in HRM raises serious ethical and data privacy issues. AI systems collect and analyze vast amounts of data about employees and candidates, including location information or behavioral patterns. It is essential to ensure compliance with data protection regulations (such as RODO), transparency in the use of data, and secure storage and processing.

Another limitation is the need to balance with the human factor. Despite the potential for automation, AI should not completely replace human judgment and interaction in HRM. HR decisions often require consideration of subjective factors, emotional intelligence and experience, which AI does not have. The most effective AI implementations are based on human-technology collaboration, where AI supports HR professionals, not replaces them.

Also, high implementation and maintenance costs and a shortage of specialists limit the use of AI in HRM. The implementation of AI systems in HRM often involves significant investments in new technology and infrastructure, as well as staff training costs. In addition, the labor market may lack qualified specialists capable of effectively implementing and operating AI tools in HR.

The next category of constraints is the risk of limiting HR decision-making. There is concern that over-reliance on AI systems could lead to a reduction in the role and autonomy of HR departments in HR decision-making. It is important that AI be a tool to support, rather than dictate, decisions.

The challenges associated with the rapid development of technology are further constraints. The pace of AI development is very fast, requiring organizations to constantly adapt and update implemented solutions and train employees on new technologies.

To facilitate deliberations on AI in HRM, a SWOT analysis was performed, as shown in Table 4.

Table 4. SWOT analysis of the use of AI in HRM

Strengths	**Weaknesses**
Improved efficiency and productivity	Automation risks
Streamlined processes	Dependence on technology
Data-driven decision making	Bias in algorithms
Cost reduction	Data privacy risks
Opportunities	**Threats**
Diffusion of next-generation innovation processes based on AI	Deepening disparities in the level of socio-economic development – negative socio-cultural transpositions
Possibility of wider implementation of the principles / dissemination of the idea of sustainable socio-economic development	People's resistance to changes related to the implementation of AI in the economy, organizations, enterprises or specific business units
Increased security	Ambiguous liability in the subject and object system when AI-related damages occur
Element of countering disinformation in societies and economies	Dysfunctions in information and communication processes
Component of building a culture of openness, flexible economies, including business entities, modern and dynamic societies	Changes in the labor market - quantitative changes (reduction of jobs), qualitative changes

Source: own elaboration.

Analyzing Table 4, it is important to note that the future of HR functions using artificial intelligence promises a significant transformation in the way human resources are managed. AI will play a key role in every stage of the employee lifecycle, from recruitment to development and engagement. The future of HR functions using AI will be characterized by greater automation, better data-driven decisions, more personalized employee experiences and a strategic approach to talent management. AI will free HR professionals from routine tasks, allowing them to focus on more strategic initiatives and helping to improve overall organizational performance and employee satisfaction. A key element, however, will be responsible and ethical implementation of AI, taking into account the impact of technology on people and organizational culture.

5. DISCUSSION

The application of artificial intelligence in human resource management is comprehensive and includes the automation of such tasks as the deployment of new employees, payroll processing, and benefits management.

AI in HR is a visible trend in the coming time. HR departments are currently undergoing the biggest transformation in history. Artificial intelligence is becoming a key component of modern HR management, changing the way employees are recruited, developed and managed. AI in HR is no longer a distant future, but a reality with tangible benefits. From automating routine tasks to advanced predictive analytics, the technology is revolutionizing traditional HR processes, making them more efficient and accurate.

In an era of digital transformation, HR departments are evolving from the traditional role of employment administrator into a strategic business partner. Artificial intelligence is becoming a catalyst for this change, bringing a new quality to HR management.

Today's HR department is undergoing a fundamental transformation. According to experts, more than half of HR executives are now focused on improving the employee experience and creating a compelling value proposition for employees. This shift in perspective calls for a new approach in which artificial intelligence supports building a more intuitive, as well as human-centered work environment.

HR's digital transformation includes the following key areas:

- digitization of documentation – providing immediate access to documents and enhancing data security,

- process automation – from recruitment to talent management,
- predictive analytics – to support strategic decision-making,
- personalizing the employee experience – tailoring development programs to individual needs.

The benefits of implementing AI in HR include improved efficiency in day-to-day work, automation of routine tasks and speeding up processes, better data analysis to support strategic planning, and a personalized approach to development and training.

It is assumed that about 1/3 of employees positively evaluate the current support of HR departments in increasing their efficiency (Kierzek-Mechlo, 2024). Therefore, the implementation of AI becomes crucial for improving these indicators. AI enables HR departments to focus on strategic aspects of HR management, while routine tasks are automated. The digital transformation of HR is not just a technological change – it is a fundamental shift in the way we think about HR management. It requires a human-centered approach that combines technology with empathy and understanding of human needs (Kierzek-Mechlo, 2024).

The implementation of artificial intelligence (AI) in management processes opens the door to myriad opportunities, while posing a number of challenges for organizations. For example, AI systems can be integrated to forecast market trends, which can significantly improve the ability to respond quickly to changes and optimize sales strategies. It should also be noted that there may be challenges associated with AI implementation, such as the need for significant investment in new technology and staff training so that new systems can be used effectively. The key to success is not only access to advanced technologies, but also the ability of an organization and its employees to adapt to a rapidly changing environment (Naxtech, 2024).

6. CONCLUSION

People's use of technology is an integral part of daily activities in every sphere of society. The large amount of information surrounding each of us requires rapid processing and systematization for high productivity in daily and professional life. The technological orientation of an organization is essential for shaping high economic performance and competitiveness of the organizational system.

Artificial intelligence and cognitive technologies have already entered the lexicon of the world of science, business and technology (Kuzior & Kwilinski, 2022). With artificial intelligence, various capabilities are making it easier for employees to work in many areas of business. A specific task of artificial intelligence is to make specific decisions in managerial activities (Kwilinski & Kuzior, 2020; Kuzior et al., 2019).

The role of AI in HR management continues to grow, changing the way HR processes are executed in almost all key areas of HRM. Due to the significant amount of data related to organizational operations, workforce management, AI is increasingly being integrated into various operational HR procedures. This integration is intended to strengthen a sustainable business framework, as noted by Votto et al. (2021). Implementing AI in HRM makes it easier for organizations to access highly qualified individuals, leading to an efficient recruitment process (Meshram, 2023). Intelligent AI technologies offer a new approach to workforce management, enhancing a company's overall performance and presenting a variety of performance management options (Khaled et al., 2023; Hemalatha et al., 2021). AI-based training enables organizations to evolve into knowledge-based entities capable of meeting personalized training needs and enhancing the quality of learning (Chen, 2022). The increasing adoption of AI in human resource management is due to its ability to generate value for customers, employees and organizations (Chowdhury et al., 2023).

Today's employers are struggling with attracting employees, retaining them and developing them within the organization. Given the fact that the population is aging and there is a growing shortage of workers, also the quality of candidates is a huge challenge for companies (Smolinski & Zakrzewska, 2018).

The overall impact of AI on HRM is related to increased efficiency and productivity: AI automates routine and time-consuming tasks, allowing HR departments to focus on strategic aspects of HR management. Automation speeds up processes and improves the efficiency of daily work.

Modern HR cannot ignore the digital revolution and the spread of artificial intelligence. With the growing use of AI, HR's role as an ethical guardian and advocate of employee interests will increase.

HR professionals will be responsible for ensuring the transparency of AI-based processes, protecting personal data and ensuring that the human aspect is preserved in human resource management.

Artificial intelligence supports HR professionals in many ways, automating routine tasks, providing valuable data for analysis and streamlining key HR processes. AI in practice relieves HR professionals of many time-consuming and routine tasks, allowing them to focus on more strategic aspects of human capital management, building relationships with employees and creating a more effective and engaging work environment.

The future of HR will be based on the concept of 'augmented intelligence', where AI enriches and enhances human work rather than replacing it. A hybrid approach to Augmented Decision-Making (ADM), in which AI supports HR decisions but acts at the behest of humans, will become increasingly common. HR professionals will need to develop new competencies related to the use of AI, such as understanding algorithms, analyzing data, managing AI systems, and being able to collaborate with intelligent technologies. AI training for HR professionals will become essential. There will be personalization on a massive scale. With AI, HR will be able to offer highly personalized employee experiences on a massive scale, from individual development paths to tailored benefit programs. In summary, the future of HR and HR processes will be characterized by close collaboration between HR departments and AI-based systems. AI will take over many routine tasks and provide valuable data for analysis, allowing HR professionals to focus on strategic initiatives and building positive relationships with employees, with an ethical and human approach.

It should be noted that thoughtful application of AI throughout the employee lifecycle can help HR overcome current challenges, and prepare for the risks and uncertainties associated with various types of disasters (e.g., a pandemic) and build a resilient HR function.

The study performed is characterized by certain limitations, such as the geographical scope of research (Polish market) and the time frame (one year) as well as the number (3) of surveyed enterprises. The presented methodology does not exhaust the spectrum of possible research methods. Nevertheless, the authors' aim was primarily to pay attention to presentation of the possibilities of using technology based on artificial intelligence in HRM. Therefore, two research questions were asked: how in practice does AI support human resources specialists and what are the current limitations of this technology and the prospects for its development? This area will be further developed in future in-depth studies. The additional research that the authors plan to conduct will be related, among other things, to deepening the subject with ethical problems of HRM and AI, and conducting interviews in a larger number of HR departments.

Funding: Co-financed by the Minister of Science under the "Regional Excellence Initiative".

REFERENCES

Aldulaimi, S., Abdeldayem, M. M., Aldulaimi, S. H. (2020). Trends And Opportunities Of Artificial Intelligence In Human Resource Management. *International Journal Ofscientific & Technology Research*, *9*(1), 3867.

AlHarthi, T. S. (2025). The Effect of AI on HRM Practices. In: *Creating AI Synergy Through Business Technology Transformation,* IGI Global, 189-202.

Anandarajan, M. (2002). Internet Abuse in the Workplace. *Communications of the ACM, 45*(1), 53-54.

Babic, B., Chen, D. L., Evgeniou, T., Fayard, A. L. (2021). Onboarding AI (A better way to onboard AI). *Harvard Business Review*, *98*(4), 56-65, hal-03276433.

Bankins, S., Formosa, P. (2020). When AI meets PC: Exploring the implications of workplace socialrobots and a human-robot psychological contract. *European Journal of Work and Organizational Psychology, 29*(2), 215–229. https://doi.org/10.1080/1359432X.2019.1620328.

Bankins, S., Formosa, P., Griep, Y., Richards, D. (2022). AI Decision Making with Dignity? Contrasting Workers' Justice Perceptions of Human and AI Decision Making in a Human Resource Management Context. *Information Systems Frontiers*, *24*, 857–875. https://doi.org/10.1007/s10796-021-10223-8.

Berg, A., Buffie, E.F., Zanna, L.F. (2018). Should We Fear the Robot Revolution? *International Monetary Fund*

Working Paper, 116(18). Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id =3221174# (10.03.2025).

Blanchard, A. L., Henle, C. A. (2008). Correlates of different forms of cyberloafing: The role of norms and external locus of control. *Computers in Human Behavior, 24*(3), 1067-1084. https://doi.org/ 10.1016/j.chb.2007.03.008.

Braganza, A., Chen, W., Canhoto, A., Sap, S. (2021). Productive employment and decent work: Theimpact of AI adoption on psychological contracts, job engagement and employee trust. *Journal of Business Research, 131*(1), 485–494. https://doi.org/10.1016/j.jbusres.2020.08.018.

Brougham, D., Haar, J. (2020). Technological disruption and employment: The influence on job insecurity and turnover intentions: A multi-country study. *Technological Forecasting and Social Change, 161*, 120276, https://doi.org/10.1016/j.techfore.2020.120276.

Cappelli, P., Tambe, P., Yakubovich, V. (2019). *Artificial intelligence in human resources management: challenges and a path forward*. Social Science Electronic Publishing. https://doi.org/10.2139/ssrn.3263878.

Chen, Z. (2022). Artificial intelligence-virtual trainer: Innovative didactics aimed at personalized training needs. *Journal of the Knowledge Economy*, *14*, 2007-2025. https://doi.org/10.1007/s13132-022-00985-0.

Chowdhury, S., Dey, P., Joel-Edgar, S., Bhattacharya, S., Rodriguez-Espindola, O., Abadie, A., Truong, L. (2023). Unlocking the value of artificial intelligence in human resource management through AI capability framework. *Human Resource Management Review*, *33*(1), Article 100899. https://doi.org/10.1016/j.hrmr.2022.100899.

Duggan, J., Sherman, U., Carbery, R., McDonnell, A. (2020). Algorithmic management and app-working the gig economy: A research agenda for employment relations and HRM. *Human Resource Management Journal, 30*(4), 114–132. https://doi.org/10.1111/1748-8583.12258.

Garima, B., Vikram, S., Vinay, K. (2020). *An Empirical Study Of Artificial Intelligence and its Impact on Human Resource Functions*. 2020International Conference on Computation, Automation and Knowledge Management (ICCAKM) Amity University.

George, G., Thomas, M. R. (2019). Integration of Artificial Intelligence in Human Resource. *International Journal of Innovative Technology and Exploring Engineering*, *9*(2), 5069-5073. https://doi: 10.35940/ijitee.L3364.129219.

Gigerenzer, G., Todd, P. M., The ABC Research Group. (1999). Fast and frugal heuristics: The adaptive toolbox. In: G. Gigerenzer, P. M. Todd, & The ABC Research Group, *Simple heuristics that make us smart* (3-34). Oxford University Press.

Guenole, N., Feinzig, S. (2018). Competencies in the AI era. *IBM Smarter Workforce Institute*. Retrievedr from: https://www. ibm.com/ downl oads/ cas/ ONNXK 64Y (10.03.2025).

Haenlein, M., Kaplan, A. (2019). A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence California Management Review, *61*(4), 5-14. https://doi.org/10.1177/ 0008125619864925.

Hemalatha, A., Kumari, P. B., Nawaz, N., Gajenderan, V. (2021). Impact of artificial intelligence on recruitment and selection of information technology companies. In: *2021 international conference on artificial intelligence and smart systems (ICAIS)*, 60-66. IEEE. https://doi.org/10.1109/ICAIS50930. 2021.9396036.

Jangbahadur, U., Ahlawat, S., Rozera, P., Gupta, N. (2025). The effect of AI-enabled HRM dimensions on employee engagement and sustainable organisational performance: fusion skills as a moderator. *In Evidence-based HRM: a Global Forum for Empirical Scholarship*, *13*(1), Emerald Publishing Limited, 85-107.

Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organiza-tional decision making. *Business Horizons, 61*(4), 577–586. https:// doi.org/10.1016/j.bushor.2018.03.007.

Jeske, D., Santuzzi, A. M. (2015). Monitoring what and how: Psychological implications of electronic performance monitoring. *New Technology, Work and Employment, 30*(1), 62–78. https://doi.org/10.1111/ntwe.12039

Jia, Q., Guo, Y., Li, R., Li, Y., Chen, Y. (2018). *A Conceptual Artificial Intelligence Application Framework in Human Resource Management*. Proceedings of the 18th International Conference onElectronic Business, 106-114. Retrieved from: https://aisel.aisnet.org/iceb2018/91 (10.03.2025),

Johnson, R. D., Hornik, S., Salas, E. (2008). An empirical examination of factors contributing to the creation of successful e-learning environments. *International Journal of Human-Computer Studies, 66*(5), 356–369. https://doi.org/10.1016/j.ijhcs.2007.11.003.

Kaplan, A., Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, *62*(1), 15–25. https://doi.org/10.1016/j.bushor.2018.08.004.

Kellogg, K. C., Valentine, M. A., Christin, A. (2020). Algorithms at work: The new contested terrain of control. *Academy of Management Annals, 14*(1), 366–410. https:// doi. org/ 10. 5465/ annals. 2018. 0174.

Khaled, A. S. D., Sharma, D. K., Yashwanth, T., Reddy, V. M. K., doewes Iqbal, R., Naved, M. (2023). Evaluating the role of robotics. In: S. Yadav, A. Haleem, P.K. Arora, H. Kumar (Eds.), Machine Learning and Artificial Intelligence in the Field of Performance Management BT - Proceedings of Second International Conference in Mechanical and Energy Technology. Smart Innovation, Systems and Technologies, *290*, 285-293, https://doi.org/10.1007/978-981-19-0108-9_30.

Kohnova, L., Papula, J., Salajová, N. (2019). Internal Factors Supporting Business and Technological Transformation in the Context of Industry 4.0. *Verslas: teorija ir praktika*, *20*, 137-145. https://doi.org/10.3846/btp.2019.13.

Kuzior, A., Kwilinski, A. (2022). Cognitive Technologies and Artificial Intelligence in Social Perception. *Management Systems in Production Engineering*, *30*(2), 109–115. https://doi.org/10.2478/mspe-2022-0014.

Kuzior, A., Kwilinski, A., Tkachenko, V. (2019). Sustainable development of organizations based on the combinatorial model of artificial intelligence. *Entrepreneurship and Sustainability Issues, 7* (2), 1353-1376. https://doi.org/10.9770/jesi.2019.7.2(39).

Kwilinski, A., Kuzior, A. (2020). Cognitive technologies in the management and formation of directions of the priority development of industrial enterprises, *Management Systems in Production Engineering*, *28*(2), 133-138. https://doi.org/10.2478/mspe-2020-0020.

Lee, M. K., Kusbit, D., Metsky, E., Dabbish, L. (2015). Working with machines: The impact of algorithmic and data-driven management on human workers. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 1603–1612. https://doi.org/10.1145/2702123.2702548.

Malik, A., De Silva, M.T.T., Budhwar, P., Srikanth, N.R. (2021). Elevating talents' experience through innovative artificial intelligence-mediated knowledge sharing: Evidence from an IT-multinational enterprise. *Journal of International Management*, *27*(4). https://www.sciencedirect.com/science/article/pii/S107542532100051X https://doi.org/10.1016/j.intman.2021.100871.

Malik, A., Budhwar, P., Srikanth, N.R. (2020), Gig Economy, 4IR and Artificial Intelligence: Rethinking Strategic HRM. In: P. Kumar, A. Agrawal, P. Budhwar (Eds.), *Human & Technological Resource Management (HTRM): New Insights into Revolution 4.0*, Emerald Publishing Limited, Leeds, 5-88. https://doi.org/10.1108/978-1-83867-223-220201005.

Marr, B., (2018). The amazing ways Unilever uses artificial intelligence to recruit and train thousands of employees. *Forbes*. Retrieved from: https:// www. forbes. com/ sites/ berna rdmarr/2018/ 12/ 14/ the-amazi ng- ways- how- unile ver- uses- artificialintelligen ce- to- recru it- train- thous ands- of- emplo yees/? sh=28675 0f562 74 (10.03.2025).

Mathipriya, B., Minhaj, I., Rodrigo, L. C. P., Abiylackshmana, P., Kahandawaarachchi, K. A. D. C. P. (2019). Employee readiness towards artificial intelligence in Sri Lankan banking context. In: *2019 International Conference on Smart Applications, Communications and Networking (SmartNets),* 1-6. IEEE.

Meshram, R. (2023). The role of artificial intelligence (AI) in recruitment and selection of employees in the organisation. *Russian Law Journal*, *11*(9s). https://doi.org/10.52783/rlj.v11i9s.1624.

Meyer von Wolff, R., Hobert, S., Masuch, K., Schumann, M. (2020). Chatbots at digital workplaces–a grounded-theory approach for surveying application areas and objectives. *Pacific Asia Journal of the Association for Information Systems, 12*(2), 63-101. https://doi.org/10.17705/1pais.12203.

Mintz, Y., Brodie, R. (2019). Introduction to artificial intelligence in medicine. *Minimally Invasive Therapy & Allied Technologies*, *28*(2), 73-81. https://doi.org/10.1080/13645706.2019.1575882.

Naxtech (2024). *Wykorzystanie sztucznej inteligencji w zarządzaniu*. Retrieved from: https://nextech.pl/technologia/wykorzystanie-sztucznej-inteligencji-w-zarzadzaniu#:~:text=Oto%20kilka%20kluczowych%20obszar%C3%B3w%2C%20w%20kt%C3%B3rych%20AI%20zmienia,kariery%20i%20program%C3%B3w%20szkoleniowych%20do%20indywidualnych%20potrzeb%20pracownik%C3%B3w (11.03.2025).

Opatha, H. H. D. N. P. (2021). A Simplified Study of Definitions of Human Resource Management. *Sri Lankan Journal of Human Resource Management, 11*(1), 15. https://doi.org/10.4038/sljhrm.v11i1.5672.

Parveen, N., Palaniammal, A. (2019). A Study on Artificial intelligence in Human Resource Managemet Today and Tomorrow, *International Journal of Research and Analytical Reviews*, *6*(1).

Piccoli, G., Ahmad, R., Ives, B. (2001). Web-based virtual learning environments: A research frame-work and a preliminary assessment of effectiveness in basic IT skills training. *MIS Quarterly*, *25*, 401–426. https://doi.org/10.2307/3250989.

Prikshat, V., Malik, A., Budhwar, P. (2021). AIaugmented HRM: Antecedents, assimilation and multilevel consequences. *Human Resource Management Review*. https://doi.org/10.1016/j.hrmr.2021.100860.

Rabenu, E., & Baruch, Y. (2025). Cyborging HRM theory: from evolution to revolution–the challenges and trajectories of AI for the future role of HRM. *Personnel Review*, *54*(1), 174-198.

Raisch, S., Krakowski, S. (2021). Artificial intelligence and management: The automation–augmentationparadox. *Academy of Management Review, 46*(1), 192–210. https:// doi.org/10.5465/2018.0072.

Ritz, E., Donisi, F., Elshan, E., Rietsche, R. (2023). Artificial Socialization? How Artificial Intelligence Applications Can Shape A New Era of Employee Onboarding Practices. In: *Conference: 56th Hawaii International Conference on System Sciences At: Lahaina, Maui, Hawaii* (*HICSS)*, 155-164. https://doi.org/10.24251/HICSS.2023.020.

Ritzer, G. (2011). The Mcdonaldization of Society. Sage. Retrieved from: https://archive.org/details/mcdonaldizationo0000ritz_e0c7/page/n7/mode/2up (11.03.2025).

Sanyaolu, E., Atsaboghena R. (2022). *Role of Artificial Intelligence in Human Resource Management: Overview of its benefits and challenges*. https://doi.org/10.13140/RG.2.2.22297.29283.

Singh, P. (2020). Technology Contributing to HR Transformation. *Studies in Indian Place Names*, *40*, 1136-1140.

Skil AI (2020). AI Recruiter Bot for Candidate Acquisition. *Chatbots Life*. Retrieved from: https://chatbotslife.com/ai-recruiter-bot-for-candidate-acquisition-467812712262 (12.03.2025).

Smoliński, M., Zakrzewska, L. (2018). *HR znów na fali wznoszącej*. Retrieved from: https://www.hbrp.pl/a/hr-znow-na-fali-wznoszacej/DRpXofbnL (11.03.2025).

Sohani, S. S., Pandey, J., Varma, A., Ray, P. (2025). Is it necessary? A framework for assessing the utility of AI in HRM practices. *Acta Psychologica*, *254*, 104816.

Stein, V., Scholz, T. M. (2020). Manufacturing revolution boosts people issues: The evolutionary need for human automation resource management in smart factories. *European Management Review, 17*(8), 391–406. https:// doi.org/10.1111/emre.12368.

Strzelczyk, K. (2019). Coaching a nowy paradygmat kariery. *Zeszyty Naukowe Wyższej Szkoły Zarządzania i Bankowości w Krakowie, 50*, 19-28.

Tewari, I., Pant, M. (2020). *Artificial Intelligence Reshaping Human Resource Management: A Review*. In: 2020 IEEE International Conference on Advent Trends in Multidisciplinary Research and Innovation (ICATMRI), 1–4. https://doi:10.1109/ICATMRI51801.2020.9398420.

van Esch, P., Black, J. S., Ferolie, J. (2019). Marketing AI recruitment: The next phase in job application and selection. *Computers in Human Behavior, 90*, 215-222, https://doi.org/10.1016/j.chb.2018.09.009.

Varsha, P. S. (2023). How can we manage biases in artificial intelligence systems – A systematic literature review. *International Journal of Information Management Data Insights*, *3*(1), Article 100165. https://doi.org/10.1016/j.jjimei.2023.100165.

Vashishth, T. K., Sharma, V., Tomer, T., Kumar, A., Kaushik, S., Singh, B. (2025). AI in HRM: Transforming Employee Engagement and Satisfaction Amidst Challenges and Opportunities. *Human Resource Management in the Age of Generative AI*, 157-188.

Villani, C. (2018). *What is artificial intelligence? Villani mission on artificial intelligence*, Mar. 2018.

Vivek, M., Yawalkar, V. (2019). A Study of Artificial Intelligence and its role in Human Resource Management. *International Journal of Research and Analytical Reviews*, *6*(1).

Votto, A. M., Valecha, R., Najafirad, P., Rao, H. R. (2021). Artificial Intelligence in Tactical Human Resource Management: A Systematic Literature Review. *International Journal of Information Management Data Insights, 1*(2). https://doi.org/10.1016/j.jjimei.2021.100047.

Waheed, A., Miao, X., Waheed, S., Ahmad, N., Majeed, A. (2019). How new HRM practices, organizational innovation, and innovative climate affect the innovation performance in the IT industry: A moderated-mediation analysis. *Sustainability*, *11*(3), 621.

Wang, X. L., Lei, N., Hou, Y. Z. (2020). How does human resource department's client relationship management affect sustainable enterprise performance-in the context of artificial intelligence? *International Journal of Technology Management*, *84*(1-2), 50-69.

Wolor, C. W., Khairunnisa, H., Purwana, D. (2020). Implementation talent management to improve organization's performance in Indonesia to fight industrial revolution 4.0. *International journal of scientific & technology research, 9*(1), 1243-1247.