

## UNCERTAINTIES AND CHALLENGES IN HUMAN RESOURCE MANAGEMENT IN THE ERA OF ARTIFICIAL INTELLIGENCE

Katarzyna ŁUKASIK-STACHOWIAK

Czestochowa University of Technology, Faculty of Management; k.lukasik-stachowiak@pcz.pl,  
ORCID: 0000-0001-7632-9513

**Purpose:** The aim of this article is to discuss the impact of Artificial Intelligence (AI) on various areas of the Human Resources Management (HRM) and to indicate whether there are uncertainties and challenges associated with it.

**Design/methodology/approach:** The article attempts to answer the following research questions: RQ1: What changes and uncertainties related to the HRM await modern enterprises?; RQ2: How do enterprises assess their ability to use AI in different areas of the HRM?; RQ3: Are enterprises ready for changes related to the implementation of AI in the HRM? Bearing the above in mind, the analysis of domestic and foreign literature sources and the author's pilot study using the online survey questionnaire as a research tool were adopted as a research method. The survey was carried out among a selected group of medium and large enterprises.

**Findings:** The evaluation of the collected data has shown that companies are mostly aware of changes and uncertainties associated with the issue of human resources management (HRM) in the era of evolution of modern technologies using AI but, due to the fact that this is a completely new situation for them, it is impossible to refer to further consequences of AI interference with the HRM.

**Research limitations/implications:** The study was a preliminary one. It is scheduled to be extended in the future to cover a wider scope of impact of AI technology on the HRM. AI is a constantly unwinding topic, so the actions taken by the company or analyzed by researchers related to the use of AI in the HRM may turn out to be outdated in the near future.

**Practical implications:** The use of the AI technology in the HRM means in practice accelerating the implementation of the HRM activities and obtaining better work efficiency, thus achieving the HRM's goals in a shorter time. This is still associated with hybrid human-and-AI work, but it is possible that human work in some HRM tasks will be completely replaced in the future by modern technology.

**Social implications:** The article indirectly addresses the issue of the prevailing anxiety and uncertainty about maintaining some jobs in the face of the development of AI tools. The hitherto research indicates that some of them may be justified, especially when it comes to repetitive analytical tasks in the HRM area.

**Originality/value:** The article discusses the current topic of the use of AI-based solutions in business.

**Keywords:** HRM, artificial intelligence, human, uncertainty, changes.

**Category of the paper:** research paper.

## 1. Introduction

Terms such as data mining, machine learning, deep learning and neural networks that were unknown in the past have become popular terms in the present, as has artificial intelligence (AI) itself. Many organizations have already begun to adopt AI technology with its benefits in mind. As a result, AI is no longer a concept of the future, treated as science fiction, but a real consequence of technological evolution (Tewari, Pant, 2020). The main reason why organizations are embracing modern technologies and accepting digital transformation is the realization of the enormous power of data and the decisive role that AI plays, affecting the speed of activities related to the transfer and analysis of data and, consequently, boosting performance of the organization. AI is now widely used in many fields of science, economy and business, as well as in everyday life. Its use is particularly visible in production, marketing, e-commerce, and the latest trend is the use of AI in the Human Resources Management (HRM). AI is a technology that enables intelligent machines to do work that humans used to do. Does this mean, then, that human work will be completely replaced by modern technology in the near future? There is no definite answer to this question, and for many researchers it is a contentious issue, but they are sure about a few things: some modern professions are already and will be performed by intelligent machines and new professions requiring new skills and qualifications meeting market requirements will appear and, most importantly, man will have to learn to cooperate with the machine. However, there are already some forecasts for professions that are particularly vulnerable to elimination from the labor market, due to the use of AI in business.

Accordingly, the article attempts to answer three research questions: RQ1: What changes and uncertainties related to the HRM await modern enterprises?; RQ2: How do enterprises assess their ability to use AI in different areas of the HRM?; RQ3: Are enterprises ready for changes related to the implementation of AI in the HRM? On the other hand, the discussion of the impact of AI on various areas of the HRM and uncertainties and the challenges associated with it was set as the research goal. The article uses both secondary data obtained from literature and online sources, as well as own research, for which an online questionnaire sent to a selected group of medium and large enterprises was used. This article in an overview tries to shed light on the applications of AI in the field of HR with particular attention to uncertainties, benefits, challenges and future opportunities that AI offers in this area. The evaluation of the collected data has shown that companies are aware of the changes and uncertainties associated with the issue of HRM in the era of evolution of modern AI-enabled technologies. Due to the fact that this is a completely new situation for them, it is impossible to refer to further consequences of AI interference with the HRM. Therefore, further research on this topic is advisable.

## 2. Literature review

### 2.1. Influence of Artificial intelligence for the labor market

There are less optimistic forecasts and a lot of uncertainty related to the use of Artificial Intelligence (AI) technology in business, which Human Resources (HR) departments must take into account when managing personnel, especially when planning and selecting training, so it is matched to the AI solutions used in the company. These forecasts suggest that professions performed by women are more vulnerable. For example, Goldman Sachs predicts that AI technologies such as ChatGPT “have a potential to transform the labor market, exposing most jobs in the country to automation” (Praca dla 80 proc. kobiet zagrożona..., 2023), which was confirmed by experts from Kenan-Flagler Business School at the University of North Carolina, who published a report according to which 79% of working women in the US (nearly 59 million) now have jobs “susceptible to disruption and effects of automation” that AI development could cause. According to researchers, 58% of employed men may be at risk from AI. On the other hand, an analysis by Revelio Labs suggests that AI can take over the work of accountants (82.9%), specialists in payroll and HR (79.7%), secretaries (74.3%), text editors and typists (65.4%) and auditors (65%). As many as 71% of workers in these professions in the US alone are women (Sztuczna inteligencja..., 2023). In Poland, too, many women perform clerical and administrative work which may indeed soon be automated. Therefore, it will be crucial for them to change their profession or improve their qualifications (Mazur, 2023).

According to a study by McKinsey Global Institute conducted in 46 countries, more than 800 million workers worldwide will lose their jobs and be replaced by robots by 2030. Thus, about 1/5<sup>th</sup> of the world’s workforce will have to find new jobs or radically improve their technical, digital, traditional and interdisciplinary skills. These skills include programming, work flexibility, and adaptability. In practice, this means that even primary school students will need to be prepared for changes, because 85% of them will work in professions that do not yet exist by 2030. However, over the next 5 years, “growth” will be included in the AI use index as an indicator within the global economic growth indicators, as well as the per capita technology of the fourth industrial revolution, along with indicators of national income, GDP, inflation and other indicators that measure the economic strength of the state (Abdeldayem, Aldulaimi, 2020). Research by the World Economic Forum shows that AI will radically change the way work is done and competence requirements for as many as 44% of jobs. Based on the data of the RocketJobs.pl job portal, addressed to office workers, it can be concluded that in Poland this trend is just germinating, but employers are beginning to appreciate this type of competences (AI a praca biurowa..., 2023). Experts identified seven challenges for the labor market in the perspective until 2030 and mentioned AI in the first place. They pointed out that the list of professions threatened by robotization and AI includes, among others: cashiers and retailers, customer service employees and telemarketers, telephone exchange operators, taxi and

van drivers, air traffic controllers, production and assembly workers, warehouse and logistics workers, insurance agents and credit intermediaries, bank employees, secretaries and office assistants, legal assistants, construction and repair workers, farmers, security and monitoring staff, and translators (Oto 7 największych wyzwań..., 2023).

What is also crucial for the labor market and running a business are legal regulations regarding the use of AI. It was not until June 2023 that the European Parliament voted on the AI Act, which is supposed to regulate the use of AI-enabled systems throughout the European Union. The regulations, the final shape of which will still be negotiated with the Member States, are to ensure that AI developed and used in Europe will be in line with the rights and values of the EU. One of the important elements of the regulations will be the requirement for transparency of tools such as ChatGPT or deepfake technology. In addition, developers of AI-based systems will be required to disclose the content and data used to train AI tools. The new rules will also introduce risk classification for AI tools (Walczak, 2023).

## **2.2. New challenges for Human Resources Management in the era of Artificial Intelligence**

The ability to efficiently manage human resources is an extremely important issue in every organization. It largely determines the direction of the organization's development and the building of its intellectual capital. Researchers interpret the notion of HRM in different ways, which makes it difficult to find a universal definition of the HRM. For some, it is simply: "(...) disposing of the organization's resources through action with and through people, to the extent determined by the owner of these resources" (Rutka, 2001). Others interpret the HRM as: "a source of potential opportunities, benefits and tangible and intangible profits (...). It is based on the belief that man should be put in a place where his or her individual abilities meet the unique opportunity to do something special. It is an expression of an optimistic vision based on the conviction that work is a place where human success meets the success of the world" (Adamiec, Kożusznik, 2000).

Armstrong explains the HRM as: „a strategic, coherent and comprehensive view of the problems related to the management and development of human resources within the structure of the enterprise, and every aspect of this process is an essential part of the management of the organization as a whole (Armstrong, 1996). Regardless of the interpretation of these the HRM definitions, it is important to invest in development of human resources and to increase skills and competences of employees. It seems to be a natural and necessary thing for modern organizations to create innovative solutions. Especially in the context of the use of AI solutions, there is an urgent need to develop new skill sets aimed at interacting with AI-enabled technology.

AI can also be defined in various ways, for example as the ability of a system to correctly interpret external data, learning from such data and using this knowledge to achieve specific goals and targets through flexible adaptation (Kaplan, Haenlein, 2019). AI can also be seen as

computational technologies that simulate or imitate intelligent behaviors of humans, even though AI behaves differently (Bhave et al., 2020). In contrast, the main categories of AI functions include: extraction of useful data, that is, discovering knowledge, representing relevant information in a way that machines can recognize, and use it to solve complex problems; developing new knowledge based on represented knowledge and techniques for finding solutions; and word and speech processing (Huang, Rust, 2018). Consequently, the development and use of AI solutions has led to significant changes in the way people work and, thus, in organizational forms, procedures and functions (Bondarouk et al., 2017). Therefore, there has emerged a need to have a new generation of workforce. This has become a key factor in the survival and transformation of enterprises in the changing environment (Ertel, 2018).

The theory and applications of the AI technology is a constantly evolving topic, despite the fact that many AI tools, such as artificial neural networks, intelligent decision systems, and fuzzy sets, are already in use in various fields (Holland, 1992). For a past few years, companies specializing in enterprise resource planning software have started to build AI modules to automate various business functions, which, in turn, requires that employees using the software should be able to operate the software or at least manage AI algorithms, for example in design. In the field of the HRM, this means that companies still lack staff with sufficient knowledge in the analysis of HR data to be able to effectively interact with algorithms integrated with business software (Sakka, Maknouzi, Sadok, 2022). AI is therefore helpful in various business areas where it can reduce the burden and pressure on employees in the workplace. It is obvious that rapid changes in business require quick reactions (Yawalkar, 2019) and AI represents a real breakthrough in business management and will have a huge impact on the way employees work, especially in the HR sphere (Abdeldayem, Aldulaimi, 2020).

The development of AI is one such transformation with far-reaching implications, especially in areas such as engineering, industrial organization and the HRM. AI in the HRM is still in the exploration phase (Sheila, 2018). It is expected that automated devices, such as machines, robots and software, may be able to perform routine tasks that humans have traditionally performed (Danysz et al., 2019; Scherer, 2015). With regard to the HRM, this means that a number of activities such as recruitment, performance management, planning compensation and benefits, training and development may become largely automated in the near future (Sakka, Maknouzi, Sadok, 2022). AI will revolutionize traditional HR functions. Of course, there are benefits, some negative effects and huge challenges to the HRM, including obsolescence of certain professions (Malik et al., 2019; Lariviere et al., 2017). But researchers on AI in the HRM have noted that, at the same time, deep learning algorithms, intelligent objects, and the Internet of Things (IoT) are particularly useful for businesses operating across borders because such solutions can foster more productive coordination and cooperation between people (Cooke et al., 2019).

Some examples of how AI can be used in HRM.

### **Recruitment and selection**

AI represents a real breakthrough in business management and will have a huge impact on the way employees work, especially in the domain of the HRM (Abdeldayem, Aldulaimi, 2020). AI-based tools help recruiters improve quality of the candidate acquisition process: it will be faster, more precisely and objective (Murphy, 2006). AI selects candidates suitable for a given position by analyzing their skills, experience and personal predispositions. Importantly, it is also easier for the candidate to contact the prospective employer and get through the application process. AI-powered bots are used to contact candidates, answer their concerns, and keep them in touch and connected throughout the recruitment process (Upadhyay, Khandelwal, 2018). AI-powered assistants or bots are well-equipped with natural language processing (NLP) capabilities, so they play a leading role in all types of communication with candidates. The NLP can easily convert speech to text in microseconds, which increases the recruiter's efficiency by eliminating typing work (Jia et al., 2018). Although the use of AI tools improves the whole process, it is obvious that a human recruiter is still necessary, because nothing can replace a person's intuition regarding the candidate's fit into the organizational culture or the assessment of soft skills (Kambur, Akar, 2022).

Either way, research shows that more and more companies are using AI tools in the recruitment. According to Career Angels, more than 61% of job advertisements for managers use application process tracking systems (ATS), and another 38% come from services such as EasyApply or LinkedIn. ATS systems allow for effective filtering and evaluation of candidates. In addition, tools that analyze CVs help in searching for key words and information, which facilitates the selection of the candidate. This is very useful for large companies that sometimes receive thousands of applications for one position. According to Jobscan, already in 2019, about 98% of Fortune 500 companies in the US used ATS systems, which only confirms their growing popularity and impact on the current labor market (Marteklas, 2023).

### **Evaluation, promotions and dismissals**

The implementation of electronic HR information systems and other cutting-edge technologies offers a number of opportunities to improve and reduce the cost of the HRM operations including the assessment of candidates (Bondarouk et al., 2017; Cooke et al., 2019) and employee performance (Abraham et al., 2019; Parry, Tyson, 2011). Systems supported by AI have made the evaluation of the employee's work faster and more effective. Scientific assessment methods, such as the 360-degree assessment, are now applied automatically. Employee evaluation criteria are entered into the system along with other useful data to obtain results based on the collected data (Otley, 1999). AI also helps an organization retain employees. By using AI-enabled software, it is easier to find employees who may be thinking about leaving the organization, and this is analyzed by observing patterns of activity while browsing the employee's activity in the computer system. So-collected data, for example over a period of a month, helps to detect a less active or efficient employee and to take appropriate steps for his the employee's further career in the company, for example promotion (Ahmed,

2018). AI can therefore predict the promotion potential of employees based on the captured data, because it can easily screen the characteristics of successful employees in specific positions (Jantan et al., 2010). The AI also receives information from its database to find out if the employee's skills have improved. Employees who fall below their performance targets are reported to the manager who can refer them to personalized training or development programs. As a result of the re-evaluation of the results, if the performance of these workers has not reached the average, they may be dismissed due to the lack of improvement (Eubanks, 2019).

While it has become a widespread concern that AI will soon replace humans as employees, AI really does contribute to layoffs, and in a literal way. Research conducted by the French consulting company B2 shows that already every tenth employment termination is generated by AI. According to HR staff, using an algorithm is a very appreciated opportunity when you need to do something as unpleasant as firing someone from work. This is also associated with saving the time of HR specialists. According to calculations, even one work hour per week counts, which can be devoted to other, productive, activities (Urbaniak, 2023).

### **Remuneration and reward system**

An important part of the HRM is the payroll and reward system directly related to the performance of employees at work. It is a process of setting employees' compensation based on established standards. An effective compensation management system in an organization strengthens both individual and group performance. A technology called "artificial neural networks" can be a useful tool in determining the level of reliability in the process of estimating remuneration. A neural network system can recognize dependencies in large data sets, mimicking the functioning of the human brain (Tewari, Pant, 2020; Jia et al., 2018). This means that AI can help develop compensation metrics to reward employees' efforts. When determining remuneration, a large amount of data is required, such as information from the CV of each employee, the results of psychometric tests carried out during selection, information collected during and after the training and development process, which also reflects specific skills of the employee. In addition to this data, continuous feedback is obtained on the performance of employees when determining remuneration. Employee compensation can be determined based on the feedback received. It is a machine learning program that defines the compensation of employees. This program offers the manager suggestions on how much the company should pay. However, the final decision belongs to the manager (Das et al., 2020). In addition to machine learning, neural networks also help in fair salary management. The neural network system can be used to create a system for fair salary assessment and to design an intelligent decision support system based on big data sets (Jia et al., 2018). Some time ago, IBM developed an application called Planning Analytics which determines the compensation of its employees based on results of performance evaluation (Goldfarb et al., 2020).

## **Training and development**

Researchers claim that AI applications could be crucial in the HRM for training purposes. Simulations, defined as AI environments, can provide a high degree of interactivity with users and improve their learning opportunities (Bell et al., 2008). AI is about information processing, logical reasoning, and mathematical skills, among other things (Huang, Rust, 2018). For employees, these demanding skills can be acquired through expertise and training. Thanks to digitalization, training and development processes can be carried out and measured online or using mobile applications. According to the results of a study conducted by Burg (2015) on 650 senior the HRM managers, with the integration of AI into the training and development process, fast, efficient and almost flawless training was achieved. According to Shanmugam (2015), an organization with an average of 500 employees loses about 3000 hours per year to evaluate performance, especially after completing training. When development assessments are carried out using the conventional method, both the manager and the employee devote a lot of time to them. Shanmugam found that incorporating AI into this process saves 50% of time in the evaluation process and 60% over the entire evaluation period. The same study claims that compensation and rewards will also be judged based on employee performance (Shanmugam, 2015).

## **3. Study**

### **3.1. Research method**

The study was conducted among 62 medium-sized and large companies in the period from February 2023 to May 2023 using the CAWI method. The study was a preliminary (pilot) one, aimed to explore the situation related to the research objective. The respondents (mainly HR managers) were asked to complete the online survey. 47 completed questionnaires were received. The study concerned the use of AI tools in the HRM. By way of selection, questions were selected thanks to which three research questions were answered: RQ1: What changes and uncertainties related to the HRM await modern enterprises?; RQ2: How do enterprises assess their ability to use AI in different areas of the HRM?; RQ3: Are enterprises ready for changes related to the implementation of AI in the HRM? The research goal was to analyze the impact of AI on various areas of the HRM and the uncertainties associated with it. Secondary studies presented in domestic and foreign literature sources and the authors' pilot study using the online questionnaire were used to analyze these matters. The characteristics of the respondents are presented in Table 1.



**Table 1.**  
*Study sample characteristics (in %)*

Enterprise size					
	Medium			Large	
Sample size	28			72	
Business type					
	IT technologies	Media & communication	Life sciences	Production	Other
Sample size	58	30	6	4	2
Business track record					
	Less than a year	1-5 years	6-10 years	Over 10 years	
Sample size	2	6	32	60	
Market					
	National			International	
Sample size	35			65	

Source: own research.

Most of the surveyed companies were large 72%. The mid-sized ones accounted for 28% of the sample. They represented the following industries: IT services (58%), media and communication (30%), life sciences (6%), production (4%), others (2%). The track record of 60% of the companies was longer than 10 years and the rest, 32%, had been active between 6 and 10 years. 65% of the companies were international and 35% domestic (Table 1). The next part of the paper attempts to answer the three research questions.

### 3.2. Research results

The collected research material was used to answer the three research questions. The obtained results and their short characteristics are presented below.

#### *RQ1: What changes and uncertainties related to the HRM await modern enterprises?*

In an attempt to answer the first research question, the answers received from the respondents regarding issues related to the use of modern AI technologies for the HRM were analyzed – first of all, whether they see concerns and uncertainties related to changes in the HRM that are a consequence of using AI solutions (Tab. 2).

In most cases, the respondents showed high awareness of the consequences of implementing AI into the HRM. 89% of the mid-sized and as many as 94% of the large enterprises were concerned about the urgency of acquiring new skills related to the use of AI by their employees. Following technological changes also forced delivery of training in AI technology, including that used in HR departments, as evidenced by 87% of “yes” answers for medium-sized companies and 89% for large companies.

**Table 2.**

*Changes, concerns and uncertainties related to the implementation of AI to the HRM (%)*

Enterprise size	Compulsion to acquire new skills related to the use of AI technology		Numerous training courses in AI technology for use in the HRM		Increasing investments in the implementation of AI solutions to the HRM		Possibility of loss of jobs due to replacement of human work in the HRM with solutions offered by AI – AI taking control		AI's bias in the HRM activities	
	yes	no	yes	no	yes	no	yes	no	yes	no
Medium	89	11	87	13	74	26	57	43	34	66
Large	94	6	89	11	91	9	78	22	46	54
<b>Total</b>	<b>183</b>	<b>17</b>	<b>176</b>	<b>24</b>	<b>165</b>	<b>35</b>	<b>135</b>	<b>65</b>	<b>80</b>	<b>120</b>

Source: own research.

Beyond any doubt, there is also the issue of increasing financial investments for the purpose of implementing AI in the HRM. 91% of the large companies considered it necessary, slightly less, 74%, of the medium-sized companies also answered “yes”. As it turns out, financial issues are not the biggest problem with the implementation of AI, but, according to a global study conducted by IBM, these are limited skills, knowledge or experience in the field of AI (34%), However, for 29% it is too high a price, and for 25% the barrier is the lack of tools or platforms for developing models (Sztuczna Inteligencja rozlewa się..., 2022). Quite a pessimistic picture is presented by the answers to the question about the concern of AI taking control in the HRM and, thus, losing jobs. 57% of the medium-sized companies and 78% of the large ones were afraid of this. It can be concluded that knowledge about AI and opportunities for using it is the greater, the larger the company. The medium-sized companies were a bit skeptical about changes after the implementation of AI. In both cases (large and small companies), and rather in the majority, the respondents were not very much concerned about biased AI in the HRM. Man is more often biased than a machine using learned algorithms, which is why this issue does not raise so much uncertainty.

*RQ2: How do enterprises assess their ability to use AI in different areas of HRM?*

The second research topic was analyzed based on data collected from the questionnaires concerning the most common areas of the HRM in which AI is used and their assessment by the respondents (Tab. 3).

**Table 3.**

*In which areas of the HRM is AI technology used most often? (in %)*

Enterprise size	Recruitment and selection	Evaluation, promotions and dismissals	Remuneration and reward system	Training and development
Medium	26	20	13	28
Large	70	32	38	68

Source: own research.

Due to the larger number of big companies in the study, their performance was relatively better than the average when it comes to the HRM in which AI technology is used. Most of the respondents from large and medium-sized companies chose recruitment and selection plus training and development. In both cases, AI was used less often in the areas of salaries, rewards

and assessments, promotions and dismissals. The selected options show a quite popular trend among the respondents. According to global research, as presented in literature, these are the areas of the HRM in which HR specialists are willing to get support from the AI technology (Tab. 4).

**Table 4.**

*Assessment of the possibilities of using AI in different areas of the HRM? (in %)*

Enterprise size	Very slight	Slight	Average	Good	Very good
Medium	0	2	2	2	21
Large	0	2	6	9	56
Total	0	4	8	11	77

Source: own research.

The respondents also rated the AI technology used in HR departments as good and very good. It can be concluded that they are already somewhat familiar with it, and it positively affects their work efficiency. Each change seems difficult to implement, especially one that is related to the support of modern, often complicated, technology. It can cause a lot of stress to the HR staff, setting new requirements for them, which they can meet with their commitment, good intentions and awareness of the need for faster work and better results. So, as in the case of implementing any other innovation to the company, what is needed is strong motivation and promotion of changes by superiors.

*RQ3: Are enterprises ready for changes related to the implementation of AI in the HRM? (in %) (Tab. 5)*

**Table 5.**

*Readiness for changes related to the implementation of AI in HRM*

Enterprise size	Definitely yes	Rather yes	No opinion	Rather not	Definitely not
Medium	11	9	4	2	2
Large	45	23	0	2	2
Total	56	32	4	4	4

Source: own research.

Due to the small size of the research sample, it is not possible to clearly state whether companies are already ready to implement and use AI in their HR departments. It can be concluded based on the answers that “yes” (45% of large companies, 11% of medium-sized ones), but the results cannot be generalized. This should be treated as an individual matter for each company. Hurry is not advisable because, as with any investment and change, a detailed analysis of AI tools is required, which in the opinion of managers will be necessary to improve the work of people.

## 4. Conclusions

The Polish market is far behind the world in the use of AI technology. Currently, only 15% of companies use it, and 13% of other companies have declared plans to implement it (according to a report by KPMG and Microsoft). Meanwhile, the global average use of AI is 35-37%, which shows great untapped potential (Paślawski, 2023). Although these results are not impressive in the case of Polish companies, it should be remembered that this is a constantly developing topic and in the near future AI will be used in every company, regardless of its size or place of origin. Advances in globalization will bring these changes like any other that global markets have faced in recent decades. The only question is what changes will companies, society and the economy still have to face? And what impact will AI technology have on human work? Hybrid work based on complementary human-and-artificial intelligence seems the most sensible, but will it be implemented in the next decade? Many unknowns and uncertainties that will probably bring about further questions, concerns and struggles of civilization with the adaptation to new living and working conditions. Companies should already be striving to modernize their ways of managing resources, including HR. AI is changing market needs, and new professions will require skills and competences that employers do not yet know. AI is a fascinating, demanding and debatable topic, which is why it requires attention of researchers, hypotheses and attempts to find answers. Therefore, this paper is an introduction to a continuation of further research in the field of the use of modern AI solutions in the HRM.

The review of domestic and foreign literature, as well as own research, has shown that companies are mostly aware of the impact of AI on human work in HR departments. The use of AI solutions is inevitable. It is a consequence of technological development and, sooner or later, companies will have to incorporate AI into their departments. Although the study has provided answers to the three research questions (RQ1, RQ2, RQ3), it can only be considered an introduction to the relevant research, due to the small size of the research sample, but it has given an overview of the issues involving AI in the HRM area.

The initial analysis of the collected research material allowed for partial achievement of the research goal: assessing the impact of AI on various areas of the HRM and identifying uncertainties and challenges associated with it. The biggest challenge or uncertainty turned out to be the acquisition of new skills by the HR staff and the training in AI technology, as well as the concerns about incurring larger financial investments in order to implement AI solutions in the HRM, which, again, can be explained by concerns regarding budget cuts in other areas of the company's operation. The surveyed companies appreciate their existing AI technologies in the HRM and use them primarily for recruitment, selection, training and development of employees. A majority of the surveyed companies are aware of benefits of AI and are ready for further innovative solutions in this area. It would be good to assume that most modern companies will share this optimistic approach to AI, recognizing its advantages and potential.

## References

1. Abdeldayem, M.M., Aldulaimi, S.H. (2020). Trends and opportunities of artificial intelligence in human resource management: Aspirations for public sector in Bahrain. *International Journal of Scientific and Technology Research*, 9(1), pp. 3867-3871.
2. Abraham, M., Niessen, C., Schnabel, C., Lorek, K., Grimm, V., Moslein, K., Wrede, M. (2019). Electronic monitoring at work: The role of attitudes, functions, and perceived control for the acceptance of tracking technologies. *Human Resource Management Journal*, 29(4), pp. 657-675. <https://doi.org/10.1111/1748-8583.12250>.
3. Adamiec, M., Kozusznik B. (2000). *Zarządzanie zasobami ludzkimi*. Kraków: Akade, pp. 13-14.
4. Ahmed, O. (2018). Artificial intelligence in HR. *International Journal of Research and Analytical Reviews*, vol. 5, no. 4, pp. 971-978. DOI:10.31221/osf.io/cfwvm
5. *AI a praca biurowa: co może zmienić sztuczna inteligencja* (2023). Retrieved from: [https://di.com.pl/ai-a-praca-biurowa-co-moze-zmienic-sztuczna-inteligencja-69286?utm\\_source=upday&utm\\_medium=referral](https://di.com.pl/ai-a-praca-biurowa-co-moze-zmienic-sztuczna-inteligencja-69286?utm_source=upday&utm_medium=referral).
6. Armstrong, M. (1996). *Zarządzanie zasobami ludzkimi. Strategia i działanie*. Kraków: Wydawnictwo Profesjonalnej Szkoły Biznesu, p. 9.
7. Bell, B.S., Kanar, A.M., Kozlowski, S.W. (2008). Current issues and future directions in simulation-based training in North America. *The International Journal of Human Resource Management*, 19(8), pp. 1416-1434. <https://doi.org/10.1080/09585190802200173>
8. Bhave, D.P., Teo, L.H., Dalal, R.S. (2020). Privacy at work: A review and a research agenda for a contested terrain. *Journal of Management*, 46(1), 127-164. <https://doi.org/10.1177/0149206319878254>.
9. Bondarouk, T., Brewster, C. (2016). Conceptualising the future of HRM and technology research. *The International Journal of Human Resource Management*, 27(21), 2652-2671. <https://doi.org/10.1080/09585192.2016.1232296>
10. Bondarouk, T., Harms, R., Lepak, D. (2017). Does e-HRM lead to better HRM service? *The International Journal of Human Resource Management*, 28(9), pp. 1332-1362. <https://doi.org/10.1080/09585192.2015.1118139>
11. Bondarouk, T., Parry, E., Furtmueller, E. (2017). Electronic HRM: Four decades of research on adoption and consequences. *The International Journal of Human Resource Management*, 28(1), pp. 98-131. <https://doi.org/10.1080/09585192.2016.1245672>
12. Burg, C. (2015). *The role of human resource management in corporate social responsibility: case study analysis of KPMG Luxembourg and PWC Luxembourg*. Unpublished Master Thesis. Luxembourg: Louvcin School of Management.
13. Cooke, F.L., Liu, M., Liu, L.A., Chen, C.C. (2019). Human resource management and industrial relations in multinational corporations in and from China: Challenges and new

- insights. *Human Resource Management*, 58(5), pp. 455-471. <https://doi.org/10.1002/hrm.21986>
14. Cooke, F.L., Wood, G., Wang, M., Veen, A. (2019). How far has international HRM travelled? A systematic review of literature on multinational corporations (2000-2014). *Human Resource Management Review*, 29(1), pp. 59-75. <https://doi.org/10.1016/j.hrmr.2018.05.001>
  15. Danysz, K., Cicirello, S., Mingle, E., Assuncao, B., Tetarenko, N., Mockute, R., Desai, S. (2019). Artificial intelligence and the future of the drug safety professional. *Drug safety*, 42(4), pp. 491-497. DOI: 10.1007/s40264-018-0746-z
  16. Das, S., Barik, R., Mukherje, A. (2020). Salary prediction using regression techniques. *Engineering Research Network (EngRN)*, Vol. 35, No. 2, pp. 1-5, doi: 10.2139/ssrn.3526707
  17. Ertel, W. (2018). *Introduction to artificial intelligence*. Springer.
  18. Eubanks, B. (2019). *Artificial Intelligence for HR Use AI to Support and Develop a Successful Workforce*. London/New York: Kogan Press.
  19. Goldfarb, A., Taska, B., Teodoridis, F. (2020). Artificial intelligence in health care? Evidence from online job postings. *AEA Papers and Proceedings*, Vol. 110, No. 11, pp. 400-404, doi: 10.1257/pandp.20201006
  20. Holland, J.H. (1992). *Adaptation in natural and artificial systems: an introductory analysis with applications to biology, control, and artificial intelligence*. Cambridge, MA: MIT Press.
  21. Huang, M.H., Rust, R.T. (2018). Artificial intelligence in service. *Journal of Service Research*, 21(2), pp. 155-172. <https://doi.org/10.1177/1094670517752459>.
  22. Jantan, H., Hamdan, A.R., Othman, Z.A. (2010). Human talent prediction in HRM using C4.5 classification algorithm. *International Journal on Computer Science and Engineering*, Vol. 2, No. 8, pp. 2526-2534.
  23. Jia, Q., Guo, Y., Li, R., Li, Y., Chen, Y. (2018). *A Conceptual Artificial Intelligence Application Framework in Human Resource Management*. Proc. ICEB Conf., pp. 106-114.
  24. Kambur, E., Akar, C. (2022). Human resource developments with the touch of artificial intelligence: a scale development study. *International Journal of Manpower*, Vol. 43, No. 1, pp. 168-205. <https://doi.org/10.1108/IJM-04-2021-0216>.
  25. 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*, vol. 62, no. 1, pp. 15-25. <https://doi.org/10.1016/j.bushor.2018.08.004>
  26. Lariviere, B., Bowen, D., Andreassen, T.W., Kunz, W., Sirianni, N.J., Voss, C., Wunderlich, N.V., De Keyser, A. (2017). Service Encounter 2.0: An investigation into the roles of technology, employees and customers. *Journal of Business Research*, 79, pp. 238-246. <https://doi.org/10.1016/j.jbusres.2017.03.008>
  27. Malik, A., Budhwar, P., Srikanth, N.R., Varma, A. (2019). *May the Bots Be with You! Opportunities and Challenges of Artificial Intelligence for Rethinking Human Resource*

- Management Practices*. Paper Accepted for presentation BAM 2019. [https://www.bam.ac.uk/sites/bam.ac.uk/files/contribution294\\_0.pdf](https://www.bam.ac.uk/sites/bam.ac.uk/files/contribution294_0.pdf)
28. Marteklas, M. (2023). *SI w rekrutacji – jakie są możliwości i ograniczenia?* Retrieved from: [https://www.chip.pl/2023/07/si-w-rekrutacji-jakie-sa-mozliwosci-i-ograniczenia?utm\\_source=upday&utm\\_medium=referral](https://www.chip.pl/2023/07/si-w-rekrutacji-jakie-sa-mozliwosci-i-ograniczenia?utm_source=upday&utm_medium=referral)
29. Mazur, P. (2023). *To kobiety powinny bardziej bać się sztucznej inteligencji*. Retrieved from: [https://www.pulshr.pl/restrukturyzacja/to-kobiety-powinny-bardziej-bac-sie-sztucznej-inteligencji,98538.amp?utm\\_source=upday&utm\\_medium=referral](https://www.pulshr.pl/restrukturyzacja/to-kobiety-powinny-bardziej-bac-sie-sztucznej-inteligencji,98538.amp?utm_source=upday&utm_medium=referral).
30. Murphy, M. (2006). Leadership IQ study: why new hires fail. *Public Management, Vol. 333611, No. 88*, pp. 1-2.
31. Otley, D. (1999). Performance management: a framework for management control systems research. *Management accounting research, vol. 10, no. 4*, pp. 363-382. <https://doi.org/10.1006/mare.1999.0115>
32. *Oto 7 największych wyzwań dla polskiego rynku pracy* (2023). Retrieved from: [https://www.pulshr.pl/zarzadzanie/oto-7-najwiekszych-wyzwan-dla-polskiego-ryнку-pracy,98652.amp?utm\\_source=upday&utm\\_medium=referral](https://www.pulshr.pl/zarzadzanie/oto-7-najwiekszych-wyzwan-dla-polskiego-ryнку-pracy,98652.amp?utm_source=upday&utm_medium=referral)
33. Parry, E., Tyson, S. (2011). Desired goals and actual outcomes of e-HRM. *Human Resource Management Journal, 21(3)*, pp. 335-354. <https://doi.org/10.1111/j.1748-8583.2010.00149.x>
34. Paślowski, K. (2023). *AI: polskie firmy są daleko za światem, ale potencjał jest wielki*. Retrieved from: <https://crn.pl/aktualnosci/ai-polskie-firmy-sa-daleko-za-swiatem-ale-potencjal-jest-wielki/>
35. *Praca dla 80 proc. kobiet zagrożona przez sztuczną inteligencję*, (2023). Retrieved from: <https://www.monitor-press.info/index.php/pl/news/19796-u-ssa-stucnii-intelekt-zagrozujero-bocim-miscyam-80-zinok>
36. *Raport: sztuczna inteligencja i starzenie się społeczeństwa wśród największych wyzwań rynku pracy*. (2023). Retrieved from: [https://www.wnp.pl/finanse/raport-sztuczna-inteligencja-i-starzenie-sie-społeczenstwa-wsrod-najwiekszych-wyzwan-ryнку-pracy,728387.amp?utm\\_source=upday&utm\\_medium=referral](https://www.wnp.pl/finanse/raport-sztuczna-inteligencja-i-starzenie-sie-społeczenstwa-wsrod-najwiekszych-wyzwan-ryнку-pracy,728387.amp?utm_source=upday&utm_medium=referral)
37. Rutka, R. (2001). Kierowanie. In: A. Czermiński, M. Czerska, B. Nogalski, R. Rutka, J. Apanowicz (eds.), *Zarządzanie organizacjami* (p. 86). Toruń: Towarzystwo Naukowe Organizacji i Kierownictwa Stowarzyszenie Wyższej Użyteczności „Dom Organizatora”.
38. Sakka, F., El Maknoui, M.E., Sadok, H. (2022). Human resource management in the era of artificial intelligence: future HR work practices, anticipated skill set, financial and legal implications. *Academy of Strategic Management Journal, 21(S1)*, pp. 1-14.
39. Scherer, M.U. (2015). Regulating artificial intelligence systems: Risks, challenges, competencies, and strategies. *Harvard Journal of Law and Technology, 29(2)*, pp. 353-400.

40. Shanmugam, S. (2015). Model employee appraisal system with artificial intelligence capabilities. *Journal of Cases on Information Technology*, Vol. 17, No. 3, pp. 30-40, doi: 10.4018/JCIT.2015070104.
41. Sheila, L.M., Steven, G., Chad, M., Mayank, G. (2018). *The new age: artificial intelligence for human resource opportunities and functions*. Ernst & Young LLP, pp. 1-8.
42. *Sztuczna Inteligencja rozlewa się po świecie* (2022). Retrieved from: <https://www.erp-view.pl/rynek-it/30036-sztuczna-inteligencja-rozlewa-sie-po-swiecie.html>
43. *Sztuczna inteligencja. Ludzie masowo stracą pracę przez ChatGPT* (2023). Retrieved from: <https://www.parkiet.com/technologie/art38683651-sztuczna-inteligencja-ludzie-masowo-straca-prace-przez-chatgpt>
44. Tewari, I., Pant, M. (2020). *Artificial Intelligence Reshaping Human Resource Management: A Review*. 2020 IEEE International Conference on Advent Trends in Multidisciplinary Research and Innovation (ICATMRI), Buldhana, India, pp. 1-4, doi: 10.1109/ICATMRI51801.2020.9398420.
45. Tewari, I., Pant, M. (2020). *Artificial Intelligence Reshaping Human Resource Management: A Review*. 2020 IEEE International Conference on Advent Trends in Multidisciplinary Research and Innovation (ICATMRI). doi:10.1109/icatmri51801.2020.9398420
46. Upadhyay, A.K., Khandelwal, K. (2018). Applying artificial intelligence: implications for recruitment. *Strategic HR Review*, vol. 17, no. 5, pp. 255-258. DOI:10.1108/SHR-07-2018-0051
47. Urbaniak, P. (2023). *ChatGPT zaczął zwalniać ludzi z pracy. Dosłownie*. Retrieved from: [https://www.telepolis.pl/amp/wiadomosci/aplikacje/chatgpt-openai-hr-zwolnienie-praca?utm\\_source=upday&utm\\_medium=referral](https://www.telepolis.pl/amp/wiadomosci/aplikacje/chatgpt-openai-hr-zwolnienie-praca?utm_source=upday&utm_medium=referral)
48. Walczak, N. (2023). *Unijne regulacje kształtują przyszłość AI. Przyjęto projekt dotyczący nowych standardów*. Retrieved from: [https://socialpress.pl/2023/06/unijne-regulacje-ksztaltuja-przyszlosc-ai-przyjeto-projekt-dotyczacy-nowych-standardow?utm\\_source=upday&utm\\_medium=referral](https://socialpress.pl/2023/06/unijne-regulacje-ksztaltuja-przyszlosc-ai-przyjeto-projekt-dotyczacy-nowych-standardow?utm_source=upday&utm_medium=referral)
49. Yawalkar, V. (2019). A Study of Artificial Intelligence and its role in Human Resource Management. *IJRAR*, Vol. 6, Iss. 1, pp. 20-24.