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Artificial Intelligence in HR: Practices and Prospects of the Spread in Ukraine

Svitlana TSYMBALIUK

Kyiv National Economic University

Alla VASYLYK

Kyiv National Economic University

Olga BILYK

Kyiv National Economic University

Abstract: The main purpose of the study is to assess the use of Artificial Intelligence (AI) in HR in Ukrainian organizations practice and the prospects of the AI spread in HR. The results of the survey confirmed the first working hypotheses that the spread of AI in HR is a natural process; and partially confirmed the second hypothesis that the use of AI in HR has both positive and negative consequences. Due to the spread of AI in HR today, one of the most important competencies of HR professionals is the ability to perform various HR functions and processes using AI technologies, which requires appropriate training and experience.

Keywords: Artificial intelligence, Human resources management, HR practices

Introduction

The modern world is hard to imagine without digital technology and Artificial Intelligence (AI). All spheres of human life and the functioning of the economy make extensive use of scientific and technological progress. There are more and more applications of Artificial Intelligence in such areas as finance, e-commerce, marketing, communications, etc. For a long time, Artificial Intelligence seemed a distant reality for the field of personnel management, until now. Automation of such traditionally routine HR functions as search and selection of candidates, resume processing, correspondence with candidates, interview planning, evaluation of professional performance, feedback collection helps to reduce the time spent on these processes and increase their efficiency. The huge potential of AI-based software for automating HR functions and cloud tools necessitates their implementation in the personnel management system of the enterprise. That is why monitoring the level of implementation of Artificial Intelligence in HR is relevant.

Literature Review

The expediency of introducing Artificial Intelligence in HR practice is confirmed by the research of theorists and the experience of practitioners. O'Connor (2020) defines Artificial Intelligence (AI) as a technology that allows computers to learn from previously collected data and to draw conclusions or recommend actions. Saxena (2020) defines AI in HR as a means of providing human resources with advanced tools for consistent decision-making to solve human resources business problems by automating repetitive tasks. Jatobaa et al (2019) conducted research on the evolution of the use of Artificial Intelligence in human resource management (HRM) over the past 18 years. The authors divide the process of implementation of Artificial Intelligence in HR into three periods: First decade, Reduction Period and Period of Growth. The first period (2000-2010) the

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authors associate with the general development of Artificial Intelligence, the emergence of interest in the use of AI in various fields and the first attempts to implement it in the field of human resource management. The second period (2011-2017) is called the "Reduction Period", as there was a decline in interest in research on the application of AI in HR, which was manifested in the absence of comprehensive targeted research and development. According to the authors, the "Period of Growth" of AI in HR implementation started in 2018. The promoters of this are the countless possibilities of automation due to the advanced achievements in the field of Artificial Intelligence, and the new requirements of companies for human resource management, which stimulate new research.

So, the results of a study conducted Matsa and Gullamajji (2019), published in the International Research Journal of Engineering and Technology, showed that the integration of artificial intelligence, which can quickly and efficiently analyze, diagnose and predict, allows more objective justification of personnel decisions and, consequently, significantly increases the efficiency of personnel management. "Integration of HR practices with AI based applicants definitely have a stronger impact in enhancing the organizational performance. Even though AI applications may not possess the abilities like humans the emotional and cognitive abilities, but these powerful AI based HR applications can analyze, predict, diagnose, and it is powerful resource for any kind of organization." stated the report (Barboza, 2019). The results of the study showed that "66% of the respondents believed that the use of AI in management systems will give rise to more transparent meritocracy in the workplace. 74% opined and predicted that within the next 10 years, AI will be standard practice for measuring the employee performance" (Barboza, 2019).

Varallyai and Hmoud (2020) conducted research on the factors influencing the intention to use personnel systems that use AI. Scientists have found that a significant impact on the intention to use AI in HR is influenced by awareness of the possibilities of using artificial intelligence in personnel management and confidence in technological innovations or new technological solutions. In addition, the study showed that HR professionals generally have a positive attitude and trust in new AI technologies to maintain the effectiveness of personnel management in organizations.

Baakeel (2020) conducted research on the relationship between the use of Artificial Intelligence in personnel management and the effectiveness of personnel processes in the company. The author proves that there is a statistically significant association between the effectiveness of personnel management functions, in particular the selection and recruitment of personnel, the analysis of talent acquisition, and the use of AI in these processes. In addition, the author substantiates that the correlation between the effectiveness of HRM functions and the use of AI is strong.

It should be noted that there is a growing trend of commitment to the implementation of AI in HR by companies. Research conducted Hmoud (2021) confirms this dynamic to the growing desire of managers to use AI in HR. The author also substantiates that technologies based on Artificial Intelligence will continue to appear, develop and offer advanced services that radically change the field of personnel management. The presence of such trends requires managers to be well-informed about the trends and innovations of AI in HR in order to keep the company in a specific environment. AI has a number of uses in HR. Berhil, Benlahmar and Labani (2020) consider the use of AI in HR in the following areas: Recruitment, Jobs & Skills Management; Employee Attrition Prediction; Employee's Turn Over; Improve human resources talents, productivity, effectiveness and performance. Barboza (2019) claims that today Artificial Intelligence (AI) is reshaping the way companies manage their workforce and considers the following uses of AI in HR: AI in Talent Acquisition; AI in Organizational Adaptation; AI in Succession Planning; AI in Training; AI in Performance appraisal; AI in Human Capital Management (HCM); AI in Retention.

Based on the generalization of the approaches of different scientists, we have formulated important theoretical and methodological principles for studying the use of AI in HR. In the dynamic information world, technology has changed approaches to enterprise management, and personnel management in particular. Artificial intelligence technologies have enabled organizations to enhance their existing performance by effectively performing personnel management functions on a day-to-day basis.

We have identified a number of factors that affect the spread of AI in HR:

- awareness of HR managers with modern technologies and the possibilities of their use in HR;
- development of AI use in HR in various areas of personnel management;
- economic feasibility of using specific AI systems in HR;
- substantiated positive and negative results of AI use in HR.

Summarizing the best practices of AI implementation in HR, we have compiled a list of the main areas of use of AI in human resource management. In particular, AI is used in the following HR functions (tasks, processes):

- preparation of a job description (requirements for a candidate for a vacant position);
- search for candidates (work with resume databases);
- professional selection (removal of resumes of candidates who do not meet the requirements of the position and/or corporate values of the company);
- correspondence with candidates, in particular with the use of chatbots;
- study of candidates' resumes;
- evaluation of candidates (based on video interviews, results of professional and psychological online testing, questionnaires, etc.);
- consulting new employees during onboarding and accompanying newly hired employees during the adaptation period;
- performance of functions of management and control of efficiency of professional activity of employees (delivery of the purposes, tasks, development of KPI);
- ensuring fairness and transparency of the remuneration system through electronic recording of employees' achievements in professional activities;
- evaluation the behavior of employees to identify their socio-psychological destructive (conflict) behavior or intentions to leave the company (reduced loyalty to the company);
- modeling, forecasting and drawing up a plan of professional and career growth for employees;
- employee engagement management;
- study of the effectiveness of working time and violations of labor behavior;
- establishing feedback with the company's staff and answering standard HR-questions of employees;
- study of the reasons and motives for dismissal.

The positive consequences of using AI in HR are:

- reduction of time spent on certain HR functions, which in turn helps to speed up the process of personnel decisions;
- accelerating the analysis of large amounts of data;
- impartiality, objectivity and transparency of personnel decisions made on the basis of the conclusions of artificial intelligence systems;
- minimization of errors related to the human factor (bias, inattention, ignorance, incompetence, etc.);
- optimization (reduction) of costs for the implementation of certain HR functions.

The negative consequences of using AI in HR are:

- partial replacement of human labor by technology, which inevitably leads to a decrease in the need for HR professionals in the labor market (rising unemployment among workers in this sector);
- lack of emotional component, namely the use of AI does not allow to take into account emotional intelligence when making personnel decisions;
- decisions made on the basis of conclusions and recommendations of artificial intelligence programs are rarely subject to critical analysis and doubt (high confidence in the machine brain);
- probability of loss of personal data and confidential information.

The main purpose of the study is to assess the use of AI in HR in Ukrainian organizations practice and the prospects of the AI spread in HR.

Methodology

The working hypotheses of the research are: the first one – the spread of AI in HR is a natural process (H1); the second one – the use of AI in HR, has both positive and negative consequences (H2). To confirm or disprove the working hypotheses, the authors have conducted quantitative research (a survey) during April - June 2021. The research aims to assess the use of AI in HR in Ukraine, to determine the prospects for its spread and the expected consequences.

The objectives of the research are the next:

- to assess the level of awareness of HR managers with the possibilities of using AI in HR;
- to define the directions of use of AI in HR;
- to substantiate the expediency of use and prospects of the spread of AI in HR;
- to determine positive and negative consequences of using AI in HR.

88 HR managers from Ukrainian companies undertook the survey. A score scale from 0 to 5 was used to assess the level of awareness of respondents with the possibilities of using AI in HR and the practicability of using AI in HR, where 0 is not advisably at all, 5 is quite advisably. A standard symmetrical scale of answers was used to determine the directions (functions, processes, tasks) of using AI in HR: “yes”, “no”, “difficult to answer”.

In order to assess the spread of using AI in HR, the positive and negative consequences of its usage it was used a scale: “completely agree”, “rather agree”, “rather disagree”, “disagree completely”, and “difficult to answer”. The analysis of the respondents’ assessment of the level of their awareness of the possibilities of using AI in HR and the practicability of using AI in HR was carried out based on the following statistical indicators – average (arithmetic average, median, mode), coefficients of variation and asymmetry, excesses, etc. The coefficient of variation was calculated by the formula (1)

$$V_{\sigma} = \frac{\sigma}{\bar{x}} \cdot 100\% \quad (1)$$

where σ – means square (standard) deviation;
 \bar{x} – arithmetic average value.

Results

Statistical indicators of the respondents’ assessment of the level of their awareness of the possibilities of using AI in HR are shown in Table 1.

Table 1. Statistical indicators of the respondents’ assessment of the level of their awareness of the possibilities of using AI in HR

Statistical indicators	Value
Arithmetic average	3.43
Standard error	0.08
Median	4
Mode	4
Standard deviation	0.78
Sample dispersion	0.62
Excess	-0.51
Asymmetry	-0.35
Interval	3
Minimum	2
Maximum	5
Total	302
Score	88

The average statistical indicators indicate a high level of respondents’ awareness of the possibilities of using AI in HR. The coefficient of variation is 22.7% (less than 33%). It indicates that the assessments of the HR managers of their awareness of the possibilities of using AI in HR are homogeneous. The asymmetry coefficient has a negative value (see Table 1) and more (by module) than 0.25 ($|A| > 0.25$), which indicates a left-sided high asymmetry in the distribution of respondents’ awareness of the possibilities of using AI in HR are homogeneous. The negative value of the excess ($E_k > 0$) indicates that the distribution is flat-topped. The distribution of respondents based on the assessment of their awareness of the possibilities of using AI in HR is presented in Figure 1.

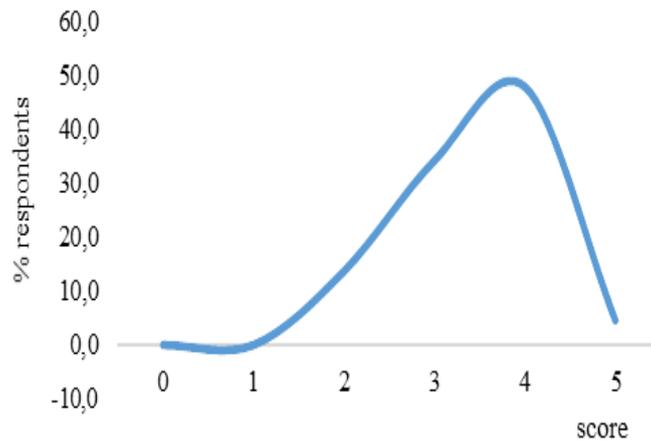


Figure 1. Distribution of respondents based on the assessment of their awareness of the possibilities of using AI in HR

Thus, the research results indicate a high rate of respondents' assessment of their awareness of the possibilities of using AI in HR. The distribution of respondents' answers to the question about using AI in HR in organizations is shown in Figure 2. According to Figure 2, 36.4% of respondents said that the organization uses AI in HR. Regarding the prospects for the spread of AI in HR, 52.3% of respondents indicated that the organization plans to use/expand the AI use in HR. This confirmed the first hypothesis (H1): the spread of AI in HR is a natural process.

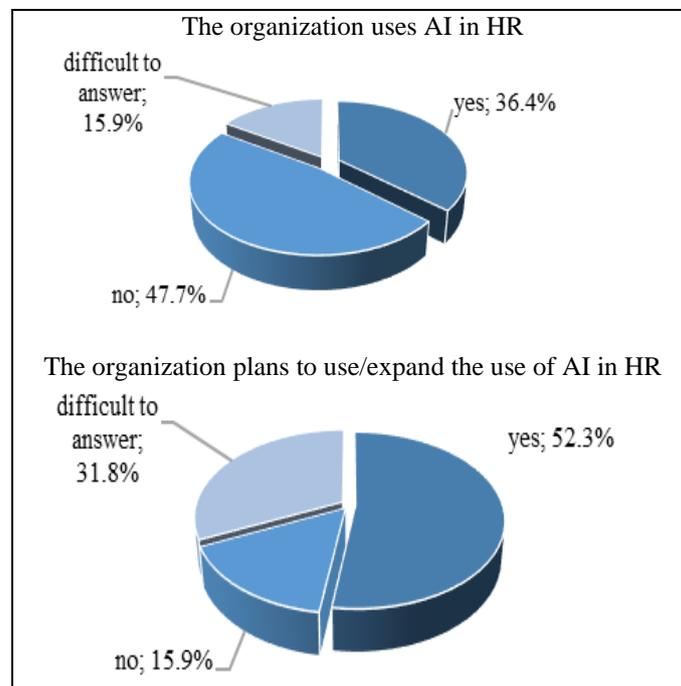


Figure 2. Using AI in HR in organizations

The survey results on using AI in HR (in organizations where AI is used in HR) are given in Table 2. According to Table 2, the most common functions of using AI in HR are search for candidates, consulting new employees during onboarding and adaptation, correspondence with candidates, in particular using chatbots, and answers to HR questions of employees.

Statistical indicators of the respondents' assessment of the practicability of using AI in HR are shown in Table 3. The average statistical indicators indicate a high level of respondents' assessment of the practicability of using AI in HR. The coefficient of variation is 26.8% (less than 33%). It indicates that the assessments of the HR managers of their awareness of the possibilities of using AI in HR assessments of the HR managers of the practicability of using AI in HR are homogeneous.

Table 2. The survey results on using AI in HR

Functions (tasks, processes)	Answers, %		
	yes	no	difficult to answer
Preparation of job description	19.0	59.5	21.4
Search for candidates	52.4	35.7	11.9
Correspondence with candidates, in particular using chatbots	45.2	45.2	9.5
Study of candidates' resumes	35.7	54.8	9.5
Evaluation of candidates (based on video interviews, test results, questionnaires, etc.)	26.2	61.9	11.9
Consulting new employees during onboarding and adaptation	52.4	38.1	9.5
Track employees' behaviour to identify their intentions to leave the company	23.8	61.9	14.3
Answers to HR questions of employees	40.5	52.4	7.1
Performing functions of control over the activities of employees	28.6	52.4	19.0
Employee performance management (set up goals and objectives, KPI development)	35.7	45.2	19.0
Compensation management	31.0	47.6	21.4
Customizing professional and career development offers for employees	35.7	47.6	16.7
Employee engagement management	23.8	54.8	21.4
Revealing abnormal behaviour, which may indicate inefficient use of time, corruption or other violations of employees	14.3	64.3	21.4
Conducting an exit interview with dismissed employees	14.3	71.4	14.3

The asymmetry coefficient has a negative value (see Table 3) and more (by module) than 0.25 ($|A| > 0.25$), which indicates a left-sided high asymmetry in the distribution of respondents' assessment of the practicability of using AI in HR are homogeneous.

Table 3. Statistical indicators of the respondents' assessment of the practicability of using AI in HR

Statistical indicators	Value
Arithmetic average	4.11
Standard error	0.12
Median	4.5
Mode	5
Standard deviation	1.1
Sample dispersion	1.2
Excess	0.88
Asymmetry	-1.19
Interval	4
Minimum	1
Maximum	5
Total	362
Score	88

The positive value of the excess ($E_k > 0$) indicates that the distribution is peaked. The distribution of respondents based on the assessment of the practicability of using AI in HR is presented in Figure 3. The results of the respondents' assessment of the prospects of the AI spread in HR are given in Table 4. According to the survey results, the vast majority of respondents (81.9%) negatively assess the prospects of complete replacement human resources by AI to perform all HR functions. Respondents' assessment of the complete replacement of human resources by AI to perform some HR functions are positive: 59.1% completely supported this idea. Respondents consider that replacement of human resources by AI to perform some HR processes is promising: 93.2% gave positive answers. The vast majority of respondents (93.2%) believed that only people can perform some HR functions and, accordingly, AI cannot replace these functions.

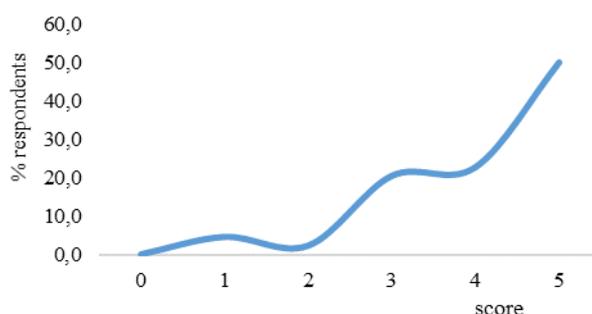


Figure 3. The distribution of respondents based on the assessment of the practicability of using AI in HR

Table 4. The results of the respondents' assessment of the prospects of the AI spread in HR

Statements	Answers, %				
	completely agree	rather agree	rather disagree	disagree completely	difficult to answer
AI can completely replace human resources to perform all HR functions	2.3	15.9	36.4	45.5	0.0
AI can completely replace human resources to perform some HR functions	15.9	43.2	27.3	11.4	2.3
AI can replace human resources to perform only some HR processes	31.8	61.4	6.8	0.0	0.0
Some HR functions can only be performed by people	75.0	18.2	6.8	0.0	0.0

Respondents' assessments of the positive consequences of using AI in HR are given in Table 5.

Table 5. Respondents' assessments of the positive consequences of using AI in HR

Statements	Answers, %				
	completely agree	rather agree	rather disagree	disagree completely	difficult to answer
Using AI saves time for HR professionals	61.4	36.4	0.0	0.0	2.3
Using AI allows you to quickly analyze large amounts of data	81.8	13.6	4.5	0.0	0.0
Using AI allows you to increase the objectivity of personnel decisions	31.8	31.8	34.1	0.0	2.3
Using AI reduces the number of errors caused by the human factor	40.9	43.2	13.6	0.0	2.3
Using AI can speed up the personnel decision-making process	27.3	29.5	13.6	4.5	2.3
Using AI reduces costs	34.1	36.4	15.9	6.8	6.8
Using AI has a positive impact on efficiency	31.8	52.3	6.8	0.0	9.1

According to the survey, the most significant positive consequences of using AI in HR are the following:

- using AI saves time for HR professionals (97.8% of respondents gave affirmative answers);
- using AI allows you to quickly analyze large amounts of data (95.4%);
- using AI reduces the number of errors caused by the human factor (84.1%);
- using AI has a positive impact on efficiency (84.1%).

Respondents' assessments of the negative consequences of using AI in HR are given in Table 6.

Table 6. Respondents' assessments of the negative consequences of using AI in HR

Statements	Answers, %				
	completely agree	rather agree	rather disagree	disagree completely	difficult to answer
The use of AI reduces the need for HR professionals and, consequently, increases unemployment	15.9	29.5	40.9	13.6	0.0
The use of AI does not allow emotional intelligence to be taken into account when making decisions	50.0	29.5	13.6	4.5	2.3
It is difficult to find errors in AI-based decisions	15.9	25.0	45.5	4.5	9.1
The use of AI complicates the process of personal data protection	2.3	27.3	38.6	18.2	13.6
The use of AI leads to intrusion into privacy	0.0	31.8	40.9	15.9	11.4
Using AI increases the likelihood of loss of confidential information	4.5	31.8	34.1	15.9	13.6
Using AI can negatively impact corporate culture	11.4	29.5	36.4	11.4	11.4

Among the most significant negative consequences identified by respondents:

- the use of AI does not allow emotional intelligence to be taken into account when making decisions (79.5% of respondents gave affirmative answers);
- the use of AI reduces the need for HR professionals and, consequently, increases unemployment (45.5%);
- it is difficult to find errors in AI-based decisions AI (40.9%);
- using AI can negatively impact corporate culture (40.9%).

Regarding the other negative consequences, less than 40% of respondents gave affirmative answers, and some negative consequences were refuted. The respondents' assessment of the consequences of using AI in HR showed that HR specialists have a positive attitude to the spread of AI technologies in HR. The respondents' assessment partially confirmed the second hypothesis (H2) that the use of AI in HR has both positive and negative consequences as respondents identified more positive effects than negative ones, and assessments of positive results far exceed the negative ones.

Since the spread of AI in HR is a natural process, as confirmed by the survey, and this process has many obvious positive consequences, managers and HR professionals must objectively assess the prospects of implementing AI technologies in HR practices bearing in mind the specifics of the organization. It is significant to find ways to minimize the negative consequences of the spread of AI in HR.

The main disadvantage of implementing AI in HR is the inability to make decisions using emotional intelligence. In this regard, it is necessary to identify decisions where emotional intelligence is critical, and people have to make such decisions. As AI use can reduce the need for HR professionals, they must prepare to retrain and master competencies to perform functions and processes that need human participation.

Conclusion

The results of the survey confirmed the first working hypotheses that the spread of AI in HR is a natural process; and partially confirmed the second hypothesis that the use of AI in HR has both positive and negative consequences. According to the survey results, the vast majority of respondents negatively assess the prospects of complete replacement human resources by AI to perform all HR functions. Respondents' assessment of the complete replacement of human resources by AI to perform some routine HR functions are positive. Respondents consider that replacement of human resources by AI to perform some HR processes is promising. The vast majority of respondents believed that only people can perform some HR functions and, accordingly, AI cannot replace these functions. Due to the spread of AI in HR today, one of the most important competencies of

HR professionals is the ability to perform various HR functions and processes using AI technologies, which requires appropriate training and experience.

Scientific Ethics Declaration

The authors declare that the scientific ethical and legal responsibility of this article published in EPSTEM journal belongs to the authors.

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Author Information

Svitlana Tsybaliuk

Kyiv National Economic University named after V. Hetman
54/1 Prospect Peremogy 03057 Kyiv Ukraine
Contact e-mail: tsybaliuk_svitlana@ukr.net

Alla Vasylyk

Kyiv National Economic University named after V. Hetman
54/1 Prospect Peremogy 03057 Kyiv Ukraine

Olga Bilyk

Kyiv National Economic University named after V. Hetman
54/1 Prospect Peremogy 03057 Kyiv Ukraine

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