Using Natural and Artificial Intelligence in the Talent Management System

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Abstract: *The article describes the nature of the use of natural and artificial intelligence in the talent management system in the Moscow Region. The extent of using talent management technology, the tools, the ratio of demand for natural and artificial intelligence in talent management, and the level of employee confidence in man (robot) in management are analyzed. It is revealed and substantiated that personnel management services and the management of companies do not effectively use natural intelligence in the framework of the talent management system, relying on chance and a typical approach. Ambiguity in the assessment of artificial intelligence by both employees and company management was revealed. Increased use and fears of the negative impact of artificial intelligence become opposing factors in talent management. It is proposed to quickly implement advanced technologies based on artificial intelligence, with no harm to the human and his potential. It is also proposed to constantly keep in focus the risks of intercepting initiatives in the management of artificial intelligence and the crowding out of a person from the labor market. The main advantage of the article is an integrated approach to the study of the pattern of using natural and artificial intelligence in the talent management system. The authors considered the issue of identifying the ratio of artificial and natural intelligence in talent management for the first time. The results can serve as a basis for further research in the system of human resource management, as well as good support for making management decisions in the implementation of artificial intelligence in business processes and organization management.*

Keywords: *natural intelligence, artificial intelligence, talent management, human potential, effectiveness, risks.*

I. INTRODUCTION

The current state of the economy requires the search for additional resources for its effective development. The world community sees them in the sphere of human potential. In accordance with the UN Development Program (UNDP), there is a continuous search for a balance between the economic efficiency of society and social justice (the UN Development Program).

All actions of the leadership of countries and companies are ultimately aimed at developing such qualities of people that significantly, often fundamentally, influence the results of their activity, the activities in which they are involved in various areas of the economy and (or) business areas. Natural and artificial intelligence are actively used. If one considers them separately, then there are already substantial theoretical developments and practical skills in many aspects of the development of human potential. This relates to the natural intellect to a greater extent. Many scientists are engaged in identifying opportunities and mechanisms for using natural intelligence in identifying talented people and developing talent. The use of artificial intelligence has not yet acquired such experience and is at the beginning of its journey.

A. Experience of using natural intelligence in the talent management system

Search and identification of talent have been both executed for a long time already. Creative, enterprising people who know how to succeed have been in demand in the labor market at all times. However, the scientific and methodological base, which allows engaging and effectively using talented people on a professional basis, appeared in the second half of the 20th century. The technology of "talent management" has evolved into a complex, constantly evolving system in the 21st century [1]; [2]; [3]. Scientists around the globe began to carefully study various aspects related to improving the efficiency of cooperating with talented people, as well as ways to keep them in an organization [4]; [5]. It should be noted that natural intelligence was used as both an external and internal factor in the development of a talent management system. The talented people themselves acted as an internal factor, showing their extraordinary abilities at the recruitment stage and during their work activity in the framework of human resource management [6]; [7]. Issues of the effectiveness of investments in human capital, including those with a gender aspect, and dividends were brought up [8]; [9]; [10]. The actions of linear management, HR specialists of companies, as well as specialized organizations involved in assessing the degree of development of natural intelligence in the system of talent management,

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constituted the external factor. In addition, they were engaged in staff training, introducing the game techniques for the development of the creative potential of talented employees into the practice in business structures [11] and during training at higher education institutions [12]; [13].

A number of scientists and practitioners adhered to the principles of "the best is looking for the best," "the best recommends the best." A search was made for the most talented among the already identified creative, well-trained and experienced leaders and specialists [14].

In Russia and in a number of other countries, talent management technology was considered to be an element of the formation, development, and use of a candidate pool [15]. Natural intelligence was used to formulate methodological foundations, to develop advanced techniques for the most effective use of the potential of talented employees of the candidate pool of an organization [7]; [16]. The issues of the most active and effective use of the company's corporate culture for the formation, development, and use of talented employees involved in the candidate pool were studied in [17].

Discrimination against talent has also come to the attention of natural intelligence. It was considered both as an external and internal talent management factor. Attention is also paid to the problems associated with ethnocultural conflicts in the labor market of Russia, Germany, and Great Britain, and the nature of their influence on the efficiency of using human potential [18].

In general, natural intelligence was actively used to explore talent and create a theoretical and methodological basis for its use. In addition, natural intelligence was also used in practical terms in the talent management system.

B. Modern approaches using artificial intelligence in identifying and developing talents

Various studies in the field of artificial intelligence (AI) lead to ambiguous conclusions, revealing the best and the worst human qualities [19]. In a number of studies, this issue is considered at the state level, studying the possibilities of human activity in the digital economy [20].

The Chinese scholar Shi [21] concludes in his work that AI in the field of accounting plays the role of a two-edged sword. On the one hand, it reduces the risks of mistakes, increases the efficiency and competitiveness of business and the use of human potential. On the other hand, AI significantly increases the risk of unemployment among workers in the field of accounting and requires both continuous and advanced training from staff.

The nature of development and replacement of natural intelligence with an artificial one in certain areas is revealed [22]. In some cases, there is a tendency for AI to help natural intelligence. Scientists from Germany use AI to determine a multidimensional model, variations of standard deviations of systematic effects. AI is interpreted by them as a machine learning algorithm [23]. Iranian and Iraqi researchers have proposed an AI-based model with higher accuracy in predicting environmental performance [24]. Indian researchers used artificial neural networks to optimize the activity of civil engineers and geotechnical engineers [25]. Egyptian and French scientists have proposed to actively use AI in the control of car systems [26].

In the field of psychology and sociology, there are also many contradictions in the use of AI. Turkish scholars investigate issues of psychological involvement and social exchange, taking the particularities of AI into account [27]. Employees' social self-esteem is viewed through distributive, procedural, and interactive equity. AI plays a positive role in this process in the research of both Canadian and Indian scientists. They proposed an innovative model using AI to study the human brain, determine the human mental state and mental illness [28]. Australian scientists propose their approach to the development of artificial neural networks, assigning the functions of imitating the structural, functional and biological features of human neural networks to them [29].

Issues of security and ethics associated with the use of AI [30]; [31] are brought up.

Research using AI in the field of medicine is actively conducted. There are many areas in which most medical research and experiments are based on the capabilities of AI.

American scientists [32] propose to use AI in medical imaging more actively and to use images from optical coherent tomography (OCT) to create flow maps from images of standard OCT.

Brazilian scientists, relying on the increased resolution of magnetic resonance imaging (MRI) scanners with a resolution of 7 T, are engaged in expanding knowledge about the structure and functions of the brain of humans and animals. Their attention is attracted by the development of tools based on machine learning and AI, which significantly accelerates the research of scientists on the localization, occurrence, and progression of neuronal loss [33]. Japanese and Indian scientists claim that AI can significantly help doctors improve diagnostic capabilities [34]; [35].

The usage of AI in the field of human resource management is specific. This fully applies to recruiting and searching for talents. AI is actively used to study candidates' resumes, assess their qualifications and rank them by significance based on this. Here the initial search for talent among the representatives of the labor market takes place. US researchers suggest using AutoViDev, a special intellectual system based on video signals, to automatically analyze a person's behavioral functions, capabilities, and prospects for the labor process [36]. Tunisian scientists advocate the use of crowdsourcing in the study and application of AI [37].

A number of companies use AI-based job matching platforms to determine whether a candidate can successfully act in a particular role or team. In addition, chatbots are created that, by automating repetitive processes, greatly facilitate and accelerate the activity of the recruiter. The company Pomato is active in this development area. With the help of machine learning algorithms, resume verification processes are automated, significantly increasing the speed of viewing resumes of candidates for technical positions. In addition, the Pomato system is developing terms of reference for determining technical skills among applicants [38].

TextRecruit used an automated recruiting interface in the market, consisting of a set of chat rooms for conducting bilateral text conversations with applicants for vacancies, speeding up and expanding communication as the recruiting process progressed in order to hire the best-talented employees faster [39].

Unilever introduced gaming technologies based on neuroscience and AI to identify talented employees and a fairly reliable forecast of the nature of employee development in the company [40].

The training of personnel and future specialists at higher education institutions is also increasingly based on the capabilities of AI. Distance learning systems are used. They are based on the capabilities of the Internet and the software which becomes more and more advanced. Gaming methods and (or) fully gaming systems for simultaneous usage and AI studying are being introduced. Ukrainian scientists have proposed the SAUDAI computer games laboratory to improve the effectiveness of teaching students in the field of IT. The laboratory provides an opportunity to develop and test AI, creating a program that can act as a real participant in computer games [41].

Thus, a large number of studies have been identified that are looking for talent in various fields of activity using both natural and AI. However, issues of using natural and artificial intelligence within the talent management system have not been raised directly. The high significance and lack of comprehensive study necessitated the current study.

II. METHODS

A. General description

The study of the pattern of use of natural and artificial intelligence in the talent management system was conducted on the basis of Moscow Region organizations using a set of sociological methods, including questionnaire, content analysis, statistical analysis methods, etc. Observation and questioning using the Google Form online service were among the empirical methods. The data obtained empirically, as well as the secondary data of statistical studies of other authors, were studied, summarized, and analyzed.

A sociological study was organized and conducted in May-June 2019 in the Moscow Region of Russia. It included two surveys on the "Talent Management" and "Artificial Intelligence in Management" topics. The study groups included representatives of the Moscow Region organizations (n = 564). The population was 19.7 million people; the sample population size was 564 people, with a 4.75% sampling error, with a confidence level of 95%.

The sampling population (n = 564) was formed during the multistage sampling of stage-by-stage selection. During the first stage, organizations of the Moscow Region were identified using random selection. As a result, the clusters were formed – organizations of the city of Moscow and the Moscow Region. During the second stage, quota sampling was used to select representatives of the organization. The quota characteristics were: gender, age, education, and the field of activity of the respondent.

Gender division revealed the priority of women – 68%, and 32% were men. The age division turned out in favor of the younger age group (18-25 years) – 73 %; 15% were at the age of 26-35 years old, 5% – at the age of 36-45 years old, 4% – at the age of 46-55 years old, and 3% – at the age over 56 years old. Higher education had 44% of people, incomplete higher education – 42%, secondary (advanced education) – 11%, other – 3%. By areas of activity, the following ones were detected: management, personnel management, technical specialties, economists, psychologists, sociologists, education, etc.

B. Algorithm

To identify the pattern of use for natural and artificial intelligence in the talent management system in the Moscow Region, a certain algorithm was used.

The study goal achievement has been determined by the solution of the following tasks: revealing of whether the Talent Management technology is used in organizations; analyzing what tools are used to identify the degree of development of natural intelligence in the system of talent management; determining whether talented employees are involved in the use of AI; identifying who (or what) is more in demand in organizations: employee talent or AI; determining whether AI can use human potential more effectively; analyzing the opinion of the population about who it trusts more in managing – a person or a robot.

C. Block diagram

Using the Talent Management technology

In the course of a sociological survey, respondents gave priority to a negative answer in some indicators to a question about the use of talent management technology in their organization – 34% were the "not used" answers (Figure 1).
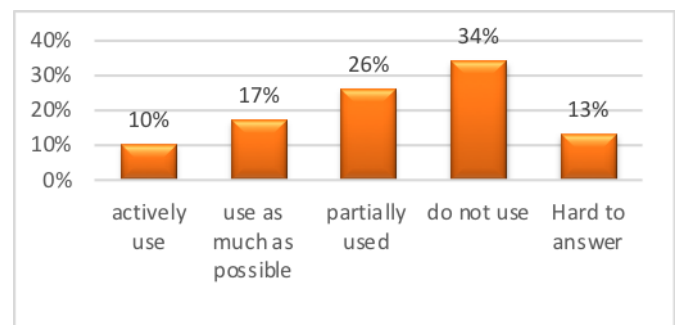

Fig. 1. Answer to the question: Do you use the Talent Management technology? Source: own research, 2019.

However, by the total indicator, "actively", "partially" and "as much as possible" amounted to 53%. "Hard to answer" was indicated by 13% of respondents.

The identification of the degree of development of natural intelligence in the system of talent management in the studied organizations of the Moscow Region is carried out using various tools (Figure 2).

Using Natural and Artificial Intelligence in the Talent Management System
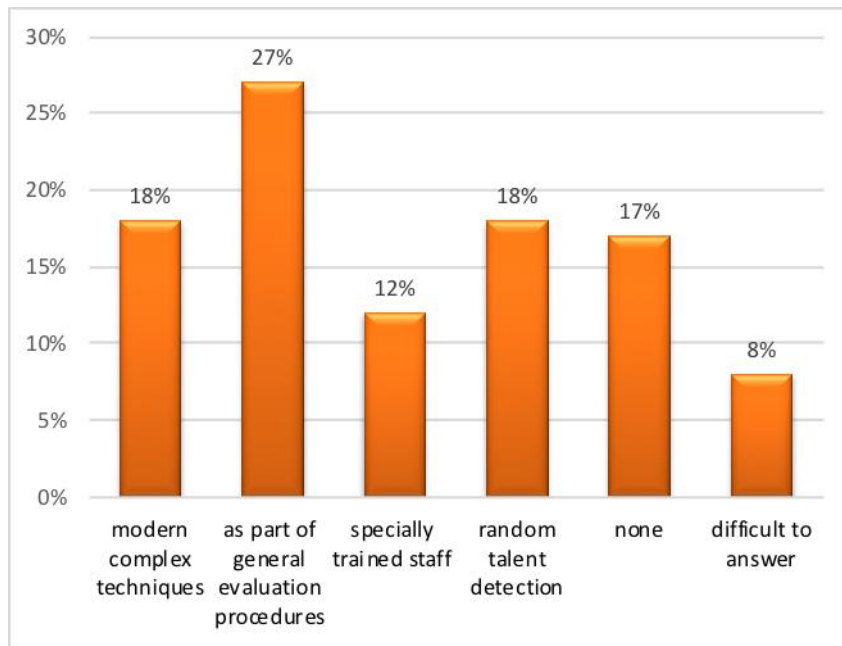
Fig. 2. The answer to the question: What tools are used to identify talent?
Source: own research, 2019.

Among the leaders were the options "as part of general evaluation procedures" (27%), "modern complex techniques" and "random talent detection" (18% each), as well as "none" (17%). "Specially trained staff" scored only 12%.

The participation of talented employees in the use of AI in 31% of cases is limited to the scope of their duties, partially used by 19% and not used at all by 20% of employees (Figure 3).
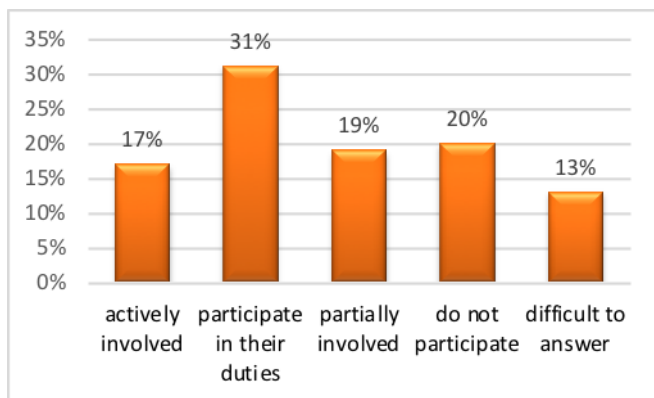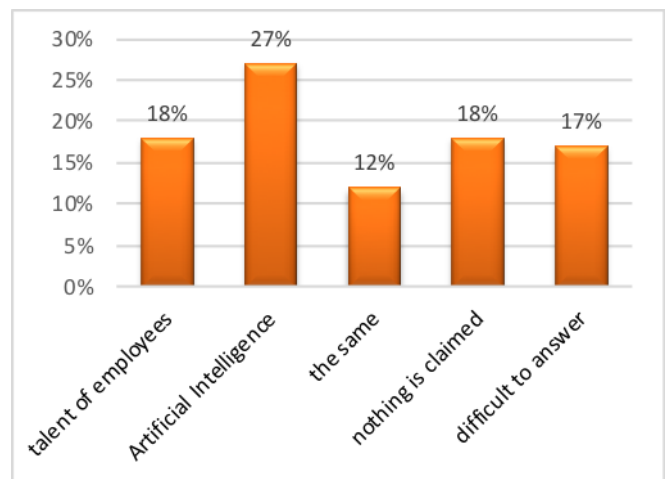

Fig. 3. Answer to the question: Are talented employees involved in using AI? Source: own research, 2019.

Only 17% of respondents actively participate in the use of AI. This question caused difficulty in 13% of respondents.

The pattern of use of AI in management

When answering the question: "Who (what) is more in demand: talent of employees or AI?" 27% of respondents chose AI (Figure 4).

Fig/ 4. The answer to the question: Who (what) is most in demand: the talent of employees or AI? Source: own research, 2019.

The options "talent of employees" and "nothing is in demand" were at the same level, 18% each; "no answer" – 17% of respondents. The last place was taken by the answer "the talent of employees and AI are equally in demand" – 12%.

The fact that AI will allow more efficient use of human potential is fully agreed by 30% of respondents, and 32% of them agree partially according to (Figure 5). Those who disagree with this statement amount to 31% (partially disagree – 21%, completely disagree – 10%).
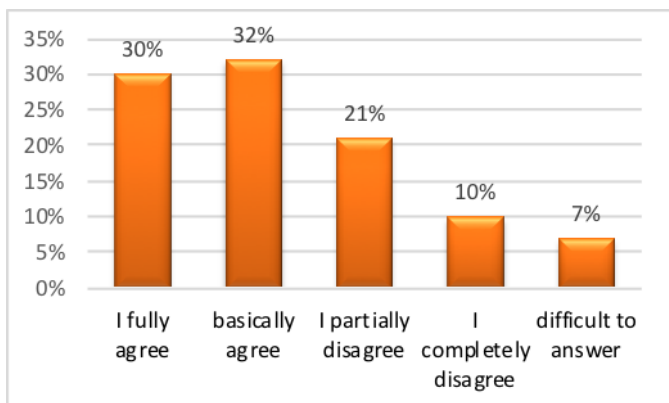
Fig. 5. Answer to the question: Will AI allow more efficient use of human potential? Source: own research, 2019.

When answering the question: "Who do you trust more in management – a person or a robot?" 47% of respondents chose a person (Figure 6).
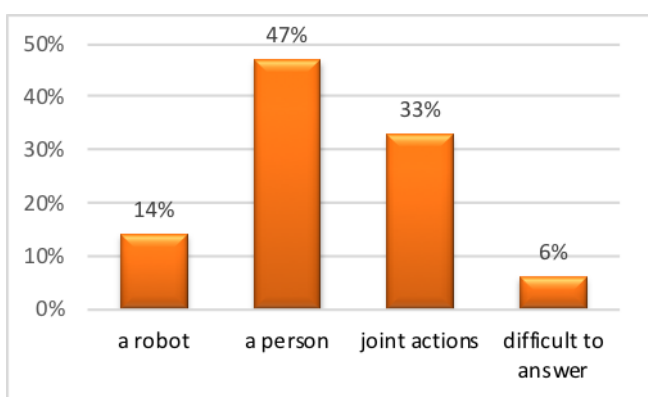

Fig. 6. Answer to the question: To whom do you trust more, to a person or a robot in management? Source: own research, 2019.

33% of the respondents voted for the joint actions of a human and a robot in management. 14% of respondents gave priority in managing to the robot, 6% found this question difficult to answer.

III. RESULTS

The technology of talent management is actively used by many companies in almost all countries of the world in one form or another. The study of the experience of organizations of the Moscow Region of Russia showed that one-third of them had not yet mastered this technology. Only 10% of organizations actively use talent management, which indicates a weak development of the personnel management service and low effectiveness of the use of natural intelligence by company management. Half of the companies use the talent of the staff partially or not to the full. This is due to poorly developed appraisal technologies and a low level of management training. Management do not seek to develop and inhibit the professional growth of subordinates for the fear of fair competition. These findings are correlated with the results of studies by Sears [1] and Smilansky [2].

They are confirmed by the answers to the question about the tools used to identify the degree of development of natural intelligence in the system of talent management. Main evaluation procedures took the first place. Practice shows that they do not allow fully revealing the degree of development of

the intelligence, potential, and talent of an employee or the workplace candidate [42]. Also, random methods and the lack of targets in the search for talent were among the leaders. A typical approach to evaluation, along with a high degree of randomness in the selection of talented employees, as well as unwillingness to be engaged in the search for talent at all, cannot lead to a high quality of talent management [16]. The fact that 18% of organizations use modern complex technologies, and 12% of organizations use specially trained personnel in the search for talented employees gives hope for improvement.

The attitude of talented employees towards AI is not unambiguous. One-third of them use AI only within the framework of their official duties, and almost half do not seek or do not use AI at all in their work. This fact is alarming, given that 62% of respondents believe that AI will allow more efficient use of human potential [43]. Talent should not deny the effectiveness of AI. Recently, AI has been increasingly used by leading companies; some government agencies are shifting their activities in whole or in part to AI, which increases labor productivity and the efficiency of their activities [35]. In this study, only 17% of organizations actively use AI.

The management of companies relies more on AI (27%) than on talented employees. There were only 12% of prudent managers who equally actively used AI and talented employees. This indicates a lack of training and limited leadership experience in using the existing resources of the organizations in the region under study. These problems were looked at in studies on the formation and use of the candidate pool [7].

The opinion of the staff is contrary to the management's vision of trust in the performance of management functions. Almost half of the respondents trust a person and only 14% consider the robot a more reliable manager. 33% of respondents gave their votes to joint actions of a man and a robot when managing personnel. Recent studies by Lobacheva [44] confirm that the possibilities of using AI technologies in personnel management are under development and the approaches to their use contradict each other in many ways.

IV. CONCLUSION

Modern companies strive to increase their competitiveness by introducing new technologies. Talent management, in which the degree of development of natural intelligence is identified, should be attributed to such new technology. As the results of the research show, a small number of organizations of the Moscow Region have fully mastered this technology. Some managers use only elements of this technology in the system of formation and development of personnel reserve. The search for talents is carried out either formally within the framework of ordinary assessment procedures, or by random method. There are also leaders who purposefully identify talented employees and rely on them in their development.

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Thus, they actively use the natural intelligence of company employees. In addition to this, competent managers are actively introducing AI. Some of them even prefer AI over natural one. Such leaders are almost a quarter of the total number. A small part of managers skillfully combines the potential of natural and artificial intelligence. This indicates a weak training of management staff, insufficient mastering of the talent management technology and the introduction of AI in business processes and system of management of organizations. There is also the trust issue considering AI. A very small number of people trust robots. Most are supporters of the human in the management system or of joint actions of the human and the robot in the management of companies. As a result, increased use and fears of the negative impact of AI become opposing factors in talent management. All this indicates the need for a balanced and skillful use of natural and artificial intelligence. It is important to quickly implement advanced technologies based on AI, without prejudice to the person and his/her potential. The arising contradictions between the ever-widespread introduction of AI in business, the control system and the danger of losing a job must be prevented or resolved with minimal losses. The risks of initiatives intercepting in the management of AI should be constantly kept in focus.

Thus, natural and artificial intelligence is used in the talent management system. However, the management has not yet reached the level of current time requirements. The applied technologies do not allow timely detection and proper use of existing human potential. It is only partially working to improve the competitiveness of companies.

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