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IMPROVING HR MANAGEMENT IN INNOVATIVE BUSINESS ORGANIZATIONS THROUGH DIGITALIZATION AND ICT*

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Abstract. Today`s business organizations face enormous challenges: an unpredictable, unsecured and complex business environment, strong competitiveness, substitute products, spoiled customers with growing needs and demands, pandemic restrictions and social isolation, post-pandemic situation and recovery, economy crisis, military conflicts etc. On this background the rapid development of information and communication technologies offers very logical and convenient way to secure company`s existence and growth. Recent past years proved that the usage of ICT in HR management opens new horizon both for the employees and their managers. On the other hand, the implementation of Artificial Intelligence and digitalization in HR management is not an unambiguous process. Still there are many open questions concerning ethics, personal freedom of employees etc. The aim of the present article is to understand the opinion of young people as future employees on the usage of ICT and AI in companies and on this base to propose some workable solutions for improving HR management in innovative business organizations. Our findings indicate that young people are not yet ready to accept the decision made only by AI without any interference from the managers. At the same time our responders admit that the most serious advantage of AI is in collection and analysis of large amounts of data, while the most serious limitation is the heavy reliance on the technology, which is the logical result in digital era.

Keywords: HR Management; digitalization; Artificial Intelligence; ICT

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JEL Classifications: D22, L21, L24, L25, L26, M14, M15, O3, O49

1. Introduction

To be successful business organization nowadays requires "gold" combination between visionary management, dedicated employees, well selected counteragents and strategic policy for continuous development and innovations. In this algorithm each element has its important role for the final equilibrium, although it could be assumed that the human factor is the based for the all the rest. The dedication of employees could be supported and developed through many different policies and tools, but recent years information and communication technologies (ICT), digitalization and Artificial Intelligence (AI) has become an integral part of innovation policy in Human Resource Management (HR Management). Parallel with the huge development and incursion of digitalization and AI, there is a public discussion regarding, based on the reasonable conferences on the level of usage AI especially specially for the purpose of HR Management. Questions such as how to se-

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cure and guarantee personal freedom of employees, or how to prevent AI and digitalized processes from the occurrence of some kind of discrimination models remain unrevealed at this moment. At the same time there is another big discussion from the legal point of view – for instance who will be liable, including legal liability, when decisions such as demotions, punishments and dismissals of employees are made directly by AI. At the middle of the 2023 the European Commission has launched initiative for adoption a specific regulation on the use of AI which is a part of overall digital strategy of the European Union. In such time of preparation of big changes which will reflect and impact all of European citizens, the opinion of young people who are the next employees and managers, becomes very important and has to be taken into consideration in the current discourse. In fact, it will be the young people whose entire working life will pass along with the use and development of AI. At the same time, the fact that young people accept innovations and changes much more easily is not unimportant. Therefore, their opinion can be decisive in the public discussion about the level of intervention of AI in HR management work processes and digitalization of organization.

The aim of the present article is to understand the opinion of young people as future employees on the usage of ICT and AI in companies and on this base to propose some workable solutions for improving HR management in innovative business organizations.

2. Theoretical background

It could be claimed that the discourse on the implementation of AI and high level of digitalization in the modern business organizations does not reach yet its peak, but even now is vivid and on the agenda both in politicians, managers, employees, and scientists. In this specific aspect the subject for AI-Augmented HRM could be considered as central and in the top focus of the scientific research. Prikshat et al. (2023) propose multilevel framework, outlining the role of the AI-Augmented HRM for the competitiveness of company and its outcomes. At the same line is the research of Malik, Budhwar and Kazmi (2023), who also develop and propose strategic framework for adoption and implementation of AI in HRM. Chowdhury et al. (2023) elaborate AI capability framework, which is designed to assist and facilitate HR managers in AI adoption in the company. Radonjić, Duarte and Pereira (2022) explore the potential of AI in decision making process in HRM. Scholars admit that one of the major roles of AI and therefore, its central potential is on the collection and fast analysis of big data massive which could be used in the decision-making process, especially when it concerns HRM decisions. Another advantage of using AI in HRM is discussed by Malik, De Silva, Budhwar and Srikanth (2021) and refers to the management and retention of talent in the organization. Scholars explore the experience of a multinational company operating in IT sectors and focus on the impact that knowledge sharing mediated by AI has on the development of talent. Allal-Chérif, Aránega and Sánchez reveal the benefits of using AI in recruitment process of talents, claiming that AI drastically improves level of their identification, selection and retention (2021). Arslan et al. (2021) explore the interaction between AI and employees, but on team level and propose different strategies for their team management. At the same time scholars admit that AI has positive impact on building good infrastructure (including facilitating environment as well as improved training opportunities for employees and securing technological competence of the employees) even before the formation of the different teams. Mikalef and Gupta (2021) prove empirically that AI integration for different processes in the business organization impacts positively and increases the level of creativity of organization as well as company`s performance.

One of the major concerns when it comes to digitalization in more general context, and particularly – the adoption of AI for the HRM purpose, is the relevance with the existing principles of ethics and culture of diversity. On this base is dedicated the research of Rodgers et al. (2023) who admit that one of the possible solutions is the usage of algorithmic positions which are also ethical ones. According to their opinion, this will help and improve the decision-making process, generated by AI. For the duality of using AI in HRM process is dedicated the study, developed by Meijerink and Bondarouk (2023). Authors develop and analyze the relationship on the axis HRM algorithms, its reflection on the autonomy of employees and their human rights as well as added value for the employees who are the subject of such algorithmic management. Recruitment of the employees executed with the help of AI could be considered as one of the sensitive topics where ethics and equality are somewhat at odds with the way algorithmic management and decision-making works. This

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specific question is the focus of a study, developed by Horodyski (2023). He has executed an empirical survey with 238 participants, who are human resource managers practitioners in attempt to understand their attitude on the usage of AI tools in the process of recruitment of new employees. His findings reveal that one of the biggest weaknesses in such recruitment is the lack of human judgment while time saving and automation are considered as the more important benefits. Almost the same opinion is shared by Pereira, Hadjielias, Christofi, and Vrontis (2023), who also admit that datamining in the process of recruitment of new staff could help HR managers to find the most appropriate candidate for the concrete job position which could lead to the improving of the effectiveness and efficiency in this specific selection process, very important part of HR activities in the company. Interesting findings in this line of consideration – relation between datamining and talent identification is proposed by Nijs, Dries, Vlasselaer and Sels (2021). On the other hand, Esch, Black and Ferolie (2019) claim that potential job candidates who experience anxiety about being evaluated by artificial intelligence in the recruitment process, do not give up on their decision to apply for a job in this same company, which uses AI. They directly admit that company should not spend time, efforts and financial resources as well for overcoming the level of anxiety of the potential candidates, generated by the implementation of AI in recruitment process. Instead, authors advise company management to focus on candidates who have a positive attitude toward using AI at workplace, including in HRM processes. Khan et al. (2023), exploring the possibilities for achievement the technological innovation trough AI specifically in conservative industries claim that service reliability has to be considered as necessary prerequisite which could guarantee the sustainability of AI in these industries. Exploring the relation between AI and business models for achieving the sustainable development goals, Di Vaio, Palladino, Hassan and Escobar (2020) affirm that innovation challenges related to the usage and adoption of AI in business organizations requires combination of varies of efforts in different aspects, such as ethics, social relations, economic and legal issues. Langer and König (2023) develop strategies to reduce opacity in algorithm-based HRM, revealing that there are three reasons for occurring opacity: first one is called system-based, second one is based on the illiteracy and the third one is intentional. Arias, Rivero and Márquez (2023) propose interesting research studying the impact between AI, bullying and harassment in the workplace. They conducted an empirical survey with 329 participants and based on the data, collected by the survey, they outline different interactions. Many researchers focus attention on the working conditions in different sectors of economy and outline the direct relation and impact between working conditions and results of their work (for instance Anguelov, 2019; Parteka, Wolszczak-Derlacz, Nikulin; 2024).

Some very specific aspects of adoption and implementation of AI in HRM are explored by Sienkiewicz-Małyjurek (2023), Anguelov (2021), Bhupathi, Prabu and Goh (2023), Dabić, Maley, Švarc and Poček (2023), Rebelo et al. (2023), Lee and Ahn (2020) etc.

Industry digitalization is one of the major important trends in changing economy. In this base Ammirato at al. (2023) identify the need for relevant theorizing the relationship and complex interactions between humans and digitalization processes in the business organizations.

All above mentioned give the needed grounds for scholars to conclude that digitalization and AI has great prerequisites to change in depth the HRM in the next years (Pan, Froese; 2023) and to put the existing relationship between manager and employees on completely new foundations. In this same line the research of Giudice, Scuotto, Orlando and Mustilli (2023) reveals interesting findings connected to the personal attitude of employees and their level of willingness to accept the adoption of AI in the company. Scholars conclude after a comprehensive analysis that the technology is the key element that defines the personal attitude of employees on the adoption of AI in HRM of the company. At the same time, they admit that this individual attitude is based and impact on the pure personal traits which they define as rational, emotional and cognitive ones (ibid). According to Zirar, Ali and Islam (2023), many of employees are suspicious to AI due to the fact that they consider AI as a threat for their jobs. At the same time, Kong, Yin, Baruch and Yuan (2023) reveal that there is a strong connection between AI trust and sustainability of career development. Scholars outline that once there is a solid collaboration between AI and employee, this will secure the sustainability of the career development of this employee.

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In summary of all that has been said so far regarding the review of the existing literature, it could be concluded that the new trends in human resource management related to digitalization, the use of ICT and the increasing penetration of AI are yet to be subject to many scientific discussions and studies. This is a still insufficiently well-researched area, which is also due to its rapid development. However, the future is invariably associated with the increasing use of AI in various processes in business organizations, including human resource management, which is why each new study, such as the present one, will contribute to enriching this discourse.

3. Methodology of the research

Our major objective is to propose a workable solution for improvement of HRM in innovative business organization using the opportunities and benefits offering by digitalization, information and communication technologies and more specifically – Artificial Intelligence. Having this major goal in mind, our scientific team has decided to explore at first step the attitudes of employees and their sincere opinion on the adoption of AI for the HRM purpose in innovative organizations. Once we have the opinion and point of view of the employees, on this basis we will be able to develop and offer a good mix of solutions, guaranteeing on the one hand the improvement and efficiency of the HR processes at organizational level, and on the other hand - the opportunities for self-expression, affirmation, motivation, creativity of the employees themselves. We decided for the purpose of the research to collect opinion of students (in regular, correspondence courses and distance forms of education) in leading Bulgarian universities and there are four major reasons for this decision as follows:

- The students are our future logical workers. The majority of students in correspondence and distance forms of educations are at the same time workers in different companies and have very clear attitude to the overall process of digitalization, ICT and AI in HRM;
- The students accept easily change and innovations, including at work; therefore, their opinion will frame the trends in HRM for the short-term period;
- The opinion of young people is important in attempt to achieve sustainable human resource management with high level of loyalty, satisfaction, motivation and responsibility of the employees;
- usually, young people do not conform to authorities, they freely express their opinion in the way they perceive things, which would lead to better credibility of the information collected.

After we determined the specific characteristics of our sample, our next methodological steps became clear. In order to prepare our questionnaire in relevance to our responders, as well as to formulate appropriate questions, we decided on preparational phase to use semi-structured interview. For this purpose, we formed 2 focus groups (2x20 students each) of representatives of our responders (both of these groups were composed by students in different forms of education). We had 6 initial open questions for discussion with each of the focus groups:

- In your personal opinion, what are the new challenges that cutting edge HRM has to offer in innovative business organizations to the employees?
- In your personal opinion, how does digitization affect HRM and employees?
- In what aspects do you think digitization helps HR managers?
- In what aspects do you think digitization helps or hinders employees in a concrete company?
- How do you think the increased use of artificial intelligence in recruiting will be perceived?
- How do you think the increased use of artificial intelligence in employee control will be perceived?

The discussions were helpful to formulate relevant questions for our main research. With the help of analysis, the information received in these two focus groups, our initial observation was proven – that young people easily change the roles – they have sound opinion both as employees but also could enter as a role of HR managers and to foresee the advantages and limitations in adoption of AI tools for HRM needs of the company. At the same time the responses from the participants in the focus groups help us to formulate the different options of answers in the final questionnaire.

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We developed our questionnaire using google forms and released the link between our students. At the same time, we share the link of the questionnaire to our colleagues from other Bulgarian universities in attempt to spread information for the survey among representatives of different universities. We have to outline that the participation in the survey was absolutely voluntary and based on the guaranteed anonymity of the responders. All participants were informed that the results of the survey and collected information will be used only for educational and scientific needs. The methodology of the research is graphically presented on fig. 1.

As a result of our efforts, we received 184 responses in total from the 7 leading universities in Bulgaria, namely: University of National and World Economy, Sofia University St. Kliment Ohridski, Technical University of Sofia, New Bulgarian University, Medical University of Sofia, University of Telecommunication and Posts and University of Chemical Technology and Metallurgy. We are pleased to conclude that in our survey we have reached more than 30% representation of the universities in Sofia (in total 22). This fact will eligible in more appropriate manner the achieved results and based on this analysis of data.

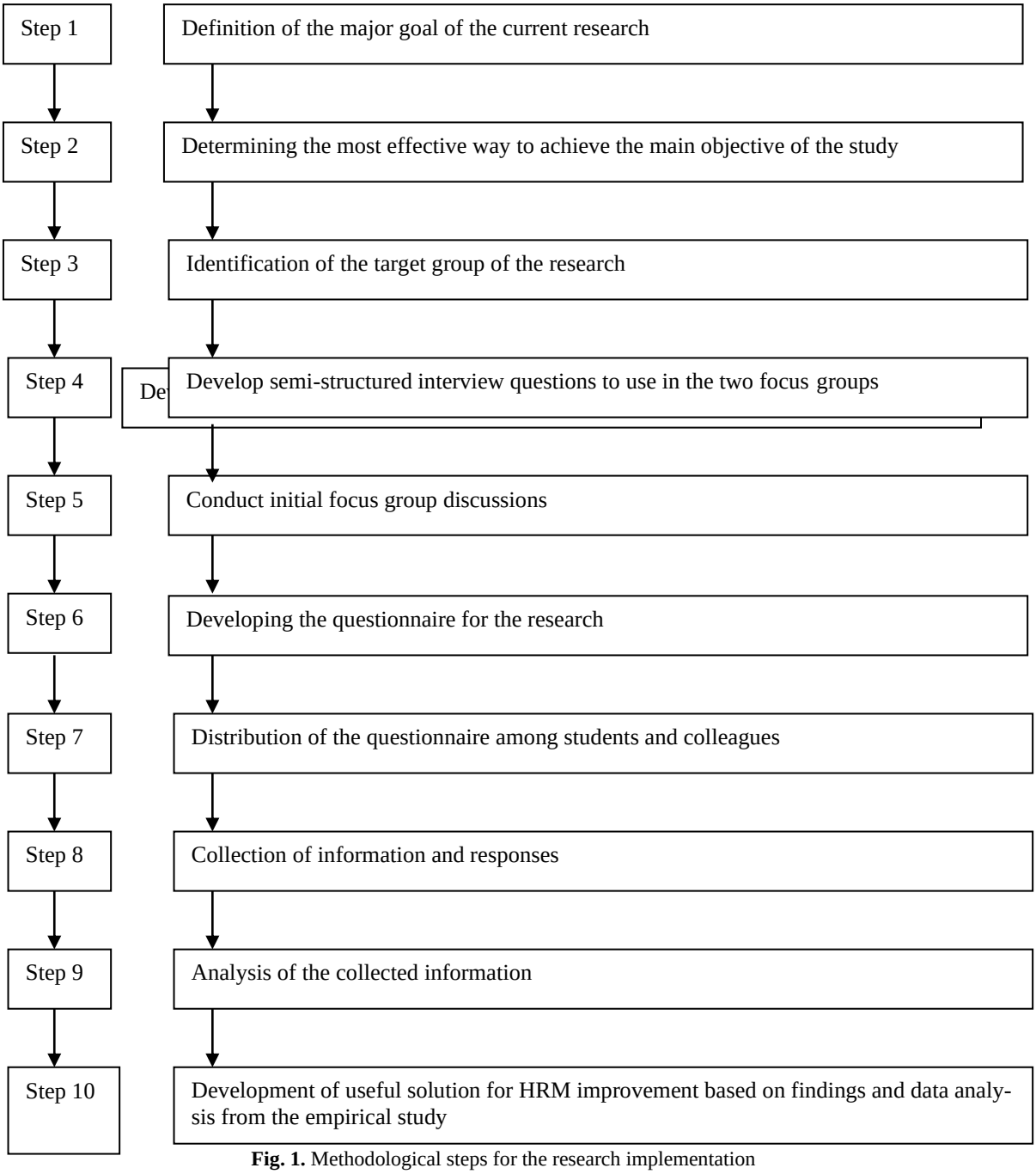

Fig. 1. Methodological steps for the research implementation

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One of our specific aims of the present article is to understand the opinion of young people as future employees on the usage of ICT and AI in companies and on this base to propose some workable solutions for improving HR management in innovative business organizations.

On this line we develop the following hypothesis:
Hypothesis 1: The majority of young people consider digitalization and AI in HRM as a natural part of the development of the modern business company.
Hypothesis 2: The majority of young people accept using AI in HRM, including in recruitment activities and control.

4. Survey results, analysis, and observations

4.1. Profile of the responders

We had 3 options as a response to this question: Male, Female and the third option was "I don`t want to answer". None of the students surveyed chose the last answer option, which fact contributes to the clarity on the gender of our respondents which is the following: from total 184 responses, we have exact 100 females' responders and 84 males. This fact gives slight advantage of the female point of view on the disputed subject (54% versus 46%), but on the other hand, considering the idea that usually females are more sensitive than men, this could benefit the final results of our survey (Table 1).

Table 1. Gender and Age of responders

Gender of responders (%)		**Age of responders (%)**		
Male	**Female**	**18-23 years old**	**24-29 years old**	**Over 30 years old**
46	**54**	**57**	**34**	**9**

In terms of responders age, the major part of students participating in the research are in the between 18-23 years old, followed by the group between 24-29 and the smallest group is formed by the representatives of students over 30 years (fig. 3).

This picture of the age of our responders in fact is logical, having in mind that in Bulgaria tertiary educational level begins usually right after the school graduation, when the students are 18 years old and lasts (again usually) 5 years – 4 years in bachelor degree and 1 or 1, 5 years for master educational programme.

The next question gives an idea for the place of birth of our responders. This information could help us to understand better the level of relation between place of birth and the level of acceptance of changes and innovations, including digitalization and AI in the workplace (fig. 2).

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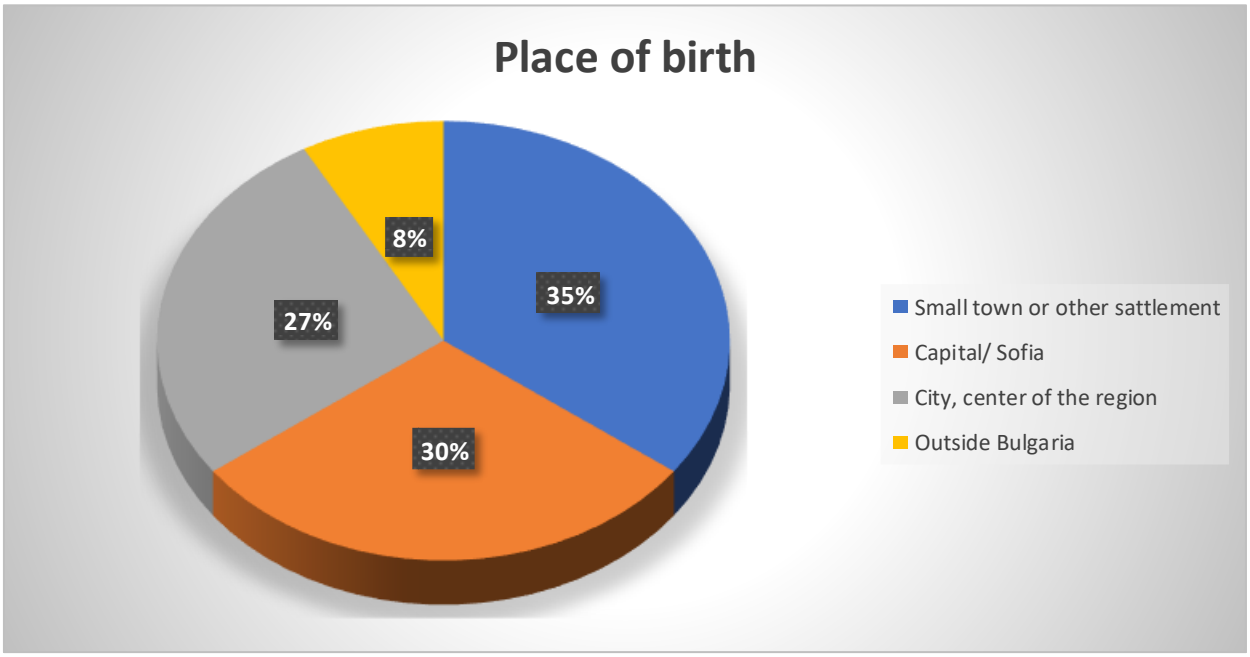

Fig. 2. Place of birth of responders

Here the smallest group is formed by the responders with place of birth outside Bulgaria. Despite the fact, that the questionnaire was distributed only in Bulgarian language, we have 8% of responders, who claim to be borne outside Bulgaria. According our observations during the years, usually these are students, coming from neighboring countries in Bulgaria who study in Bulgarian languages Bachelor or Master programmes (Citizens of Republic of North Macedonia, Serbia) or students, coming from historical formed Bulgarian community abroad – such as Bessarabian Bulgarians. Here it could be also assumed that there are representatives of Ukrainian refugees. Interesting finding is that the major group of responders claims for birthplace small town or other settlement (35% or 64 of responders). This fact is curious considering the demographic statistic of the countries, where we have a clear concentration of population in the capital of Bulgaria and in big cities (such are the regional city centers).

The last question about the profile of the responders justifies the working experience of the students (fig. 3). Almost the half of the responders combines studying at the university with work. This statement is often practice for Bulgarian students, who try to be financial independent from their parents. On the other hand, our survey was distributed also among students in correspondence and distant form of education, who usually choose these of education precisely because of the opportunity to work full-time. Another almost 40% of participants stated that they did not work at the time of the survey but had work experience mainly related to seasonal work. The rest of responders are focused on the study as priority. This picture provides us with a very good level at students who have some job experience – 88% of responders, which is important for the purpose of our survey.

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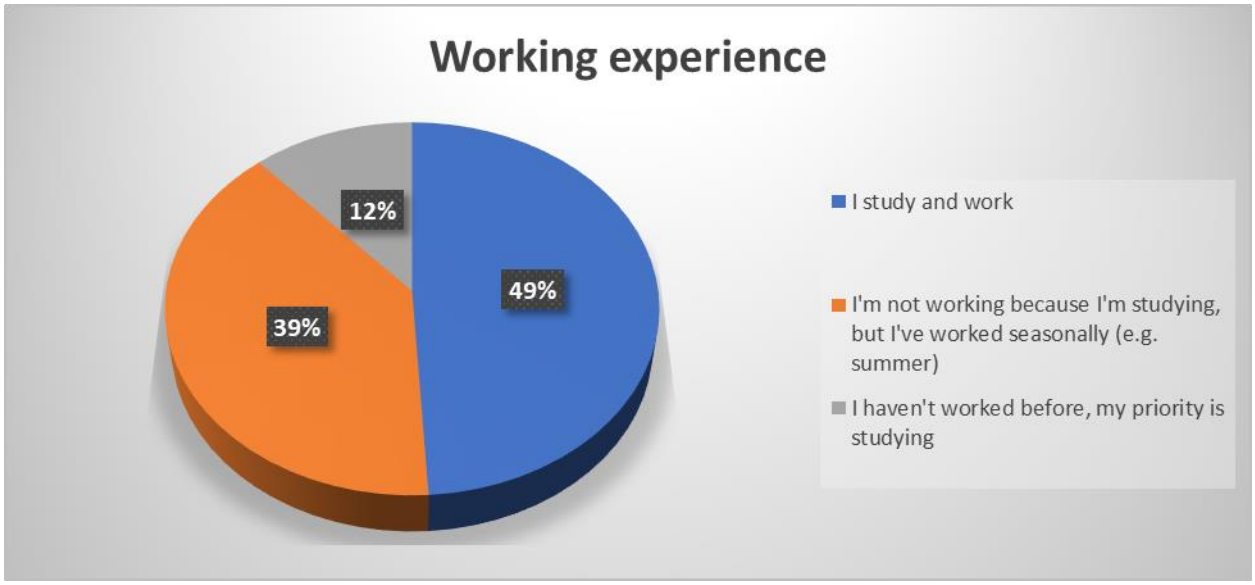

Fig. 3. Working experience of respondents

4.2. Attitude of young people towards digitalization and using AI for HRM in business

This section of the questionnaire includes 11 closed questions. Here the responders have to choose between different ratings (according to a five-point Likert scale) or between different types of predefined answers. First one of these questions is the following: Would you apply for a job at a company that uses Artificial Intelligence in recruiting? As it can be seen from the results (fig. 4), the major part of our responders is willing to apply in company which uses AI for candidate selection (in total 93 responders are positive, which makes exactly the half of responders). The group of people with negative answers to this question is 55 in total, which makes almost 30% of responders. Here the number of people who claim that cannot decide is not negligibly small. One of the possible explanations on this fact is that perhaps they do not perceive themselves as people well-versed in this topic and therefore cannot make their choice.

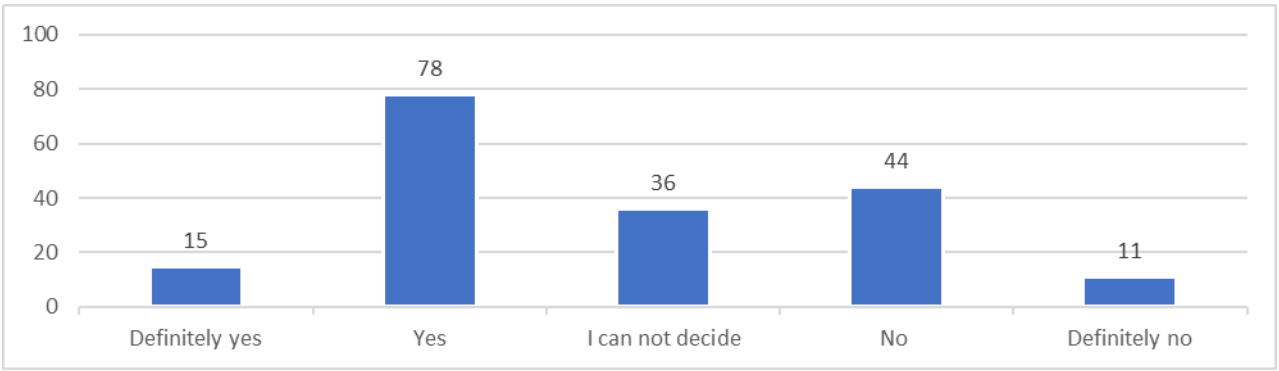

Fig. 4. Results obtained in response to the question "Would you apply for a job at a company that uses Artificial Intelligence in recruiting?"

The next question is "Would you work for a company that uses Artificial Intelligence to control work processes?". The results are more than curious – we have almost equal number of answers with "Yes" and "No" (with a minimum margin of 1 vote for respondents who chose the answer „No") and almost the same results for the two very opposite opinions, this time with slight predominance of students, who choose definitely "yes". Here the number of persons who cannot decide is visibly less, compared to the previous answer. Therefore, when it comes to workplace control, the picture becomes clearer.

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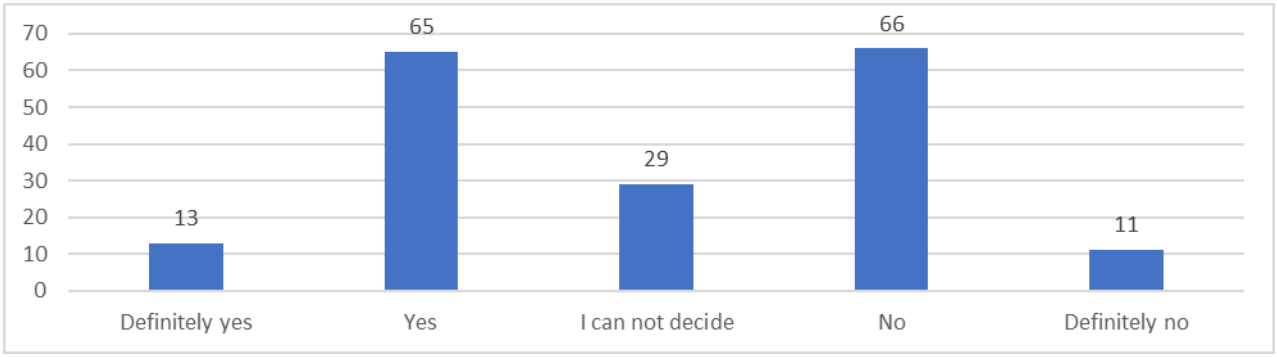

Fig. 5. Results obtained in response to the question "Would you work for a company that uses Artificial Intelligence to control work processes?"

Motivation is in the center of the following question, which is the following: "Would you feel motivated as an employee if the company you work for uses Artificial Intelligence to evaluate your work?" (fig. 6). Here the results could be considered rather surprising – the number of people with negative answers is significantly bigger than the groups with positive answers – 97 versus 52 – almost twice. This fact is interesting having in mind that AI tools could secure unbiased assessment, lack of subjective personal opinion and equal criteria for evaluation to all employees.

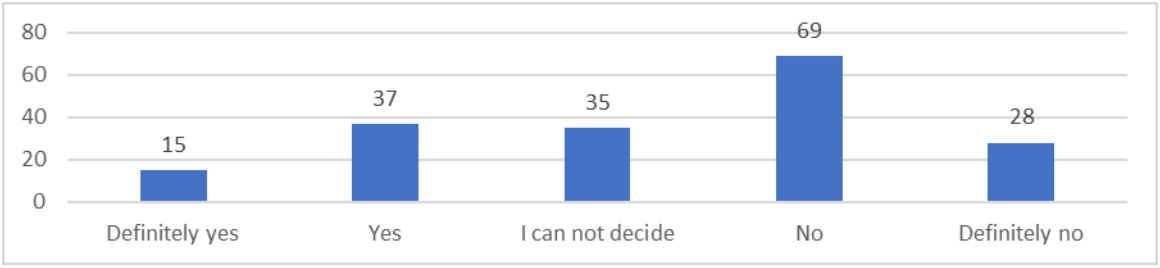

Fig. 6. Results obtained in response to the question: "Would you feel motivated as an employee if the company you work for uses Artificial Intelligence to evaluate your work?"

In the line of motivation is the question for commitment: „Would you feel committed to meeting organizational goals (i.e. would you give your full effort) if the company you work for uses Artificial Intelligence to evaluate your work?". Here the majority of responders claim the positive answer, perhaps driven by the presumption that they will always put in a sufficient amount of effort as employees, regardless of how management provides control over their work (99 positive answers in total, which makes 54% of responders).

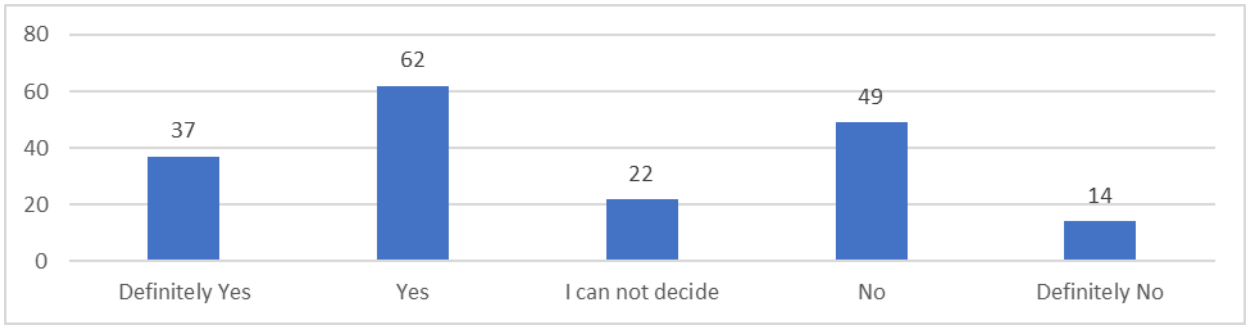

Fig. 7. Results obtained in response to the question: "Would you feel committed to meeting organizational goals if the company you work for uses Artificial Intelligence to evaluate your work?"

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The next two questions are content related and cover the assessment of level of acceptance of responders in first case – the incentive, and in the second case – the punishment is decided directly by AI. The questions are as follows: "Would you accept it if the incentive you receive for a job well done was determined directly by Artificial Intelligence rather than your direct manager?" and "Would you accept it if the punishment you receive for not doing a good job was determined directly by Artificial Intelligence rather than your direct manager?".

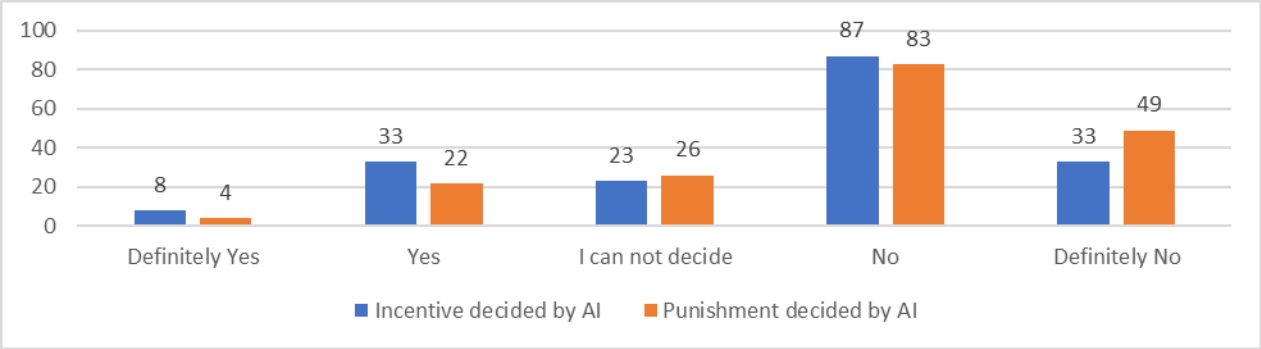

Fig. 8. Results obtained in response to the questions for level of acceptance incentive and punishment decided by AI

Despite slight differences between the responses of these two questions, the trend remains the same – definitely positive answers are minority, and the majority of responders choose "no" as an answer of both questions. At the same time, the number of people who choose definitely "no" as response to the second question increases from 33 to 49. Therefore, students are not willing to accept both incentive and punishment at work, if this decision is made only by AI. However, the level of negative definiteness increases when it comes to the punishment.

For the next two questions the responders are asked to rate what they think are the indisputable benefits for the employees themselves in using Artificial Intelligence and digitalization of human resources (with 5 being the most beneficial and 1 being the least beneficial). The same rate is used for the assessment on the undeniable limitations for employees in digitization and artificial intelligence for human resource management? (with 5 being the most restrictive and 1 being the least). The final results after additional calculations of the achieved average score in each of the indicators are presented on the fig. 9 and fig. 10.

As it can be seen on fig. 9, the top three indicators for the real benefits from the adoption of AI in HRM from the employees' point of view are the following: Facilitates the collection and analysis of large amounts of data on productivity, employee's satisfaction etc. with the highest average score of 4,39. The second place is for the indicator: Facilitates administrative tasks such as payroll processing, attendance tracking, etc. with the average score of 4,22, followed by easy access to educational resources for employees (4,17). The lower score is for the indicator "facilitates employees career development processes" with average score 3,05.

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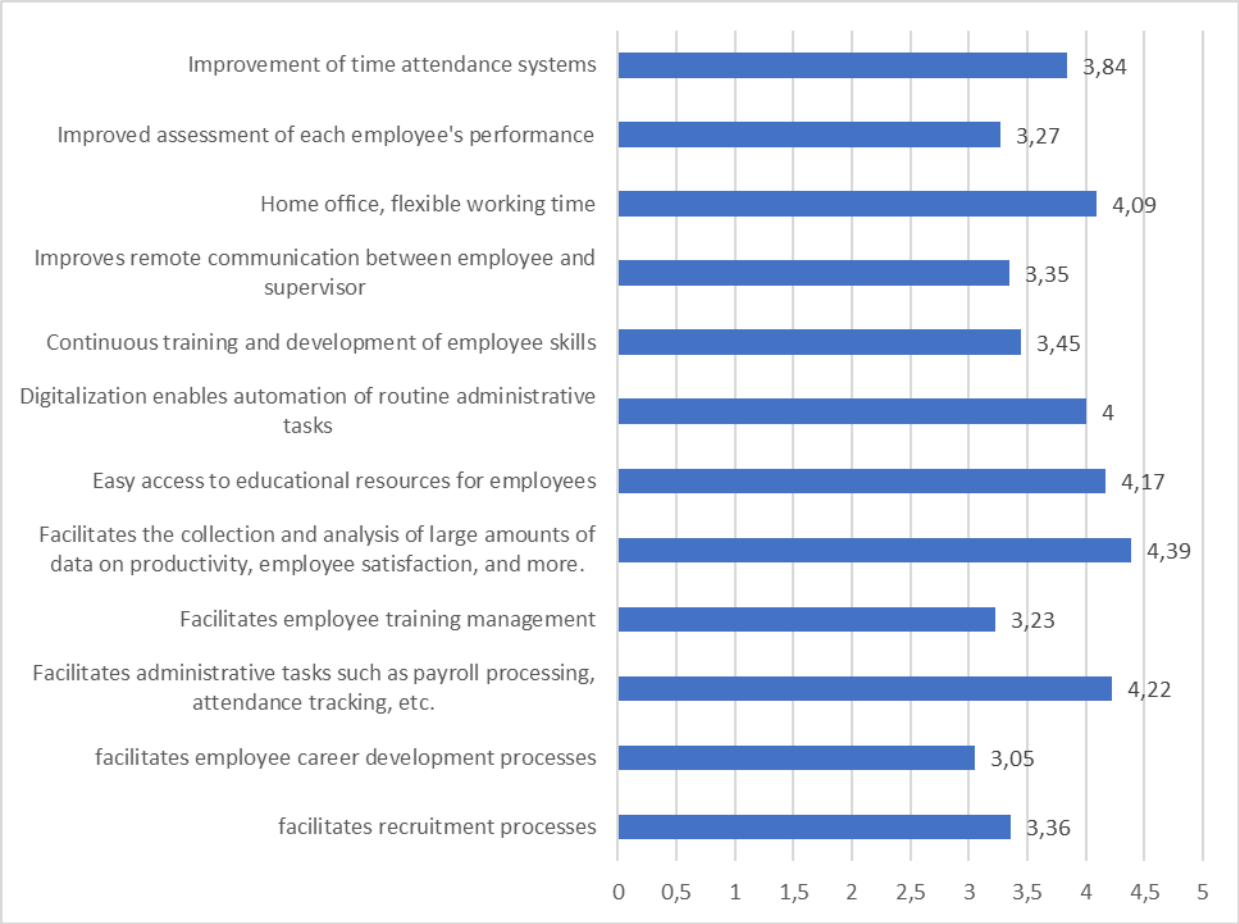

Fig. 9. Average score by indicators of the benefits for the employees in the process of usage AI in HRM

According to the assessment of our responders, there is only one limitation which has high impact on the limitations for the employees in the process of usage AI in HRM and this indicator is the heavy reliance on the technology, which could be considered as major concern, with average score of 4,15 (in maximum 5,00 scale). This is the only one indicator which passes the 4,00 score. The rest of predefined indicators for limitations are with almost similar results with slight differences. However, the second place among them is the indicator for increasing the fear of substitution by new technologies (with average score of 3,94) closely followed by the indicator for lack of social contact and interaction with colleagues.

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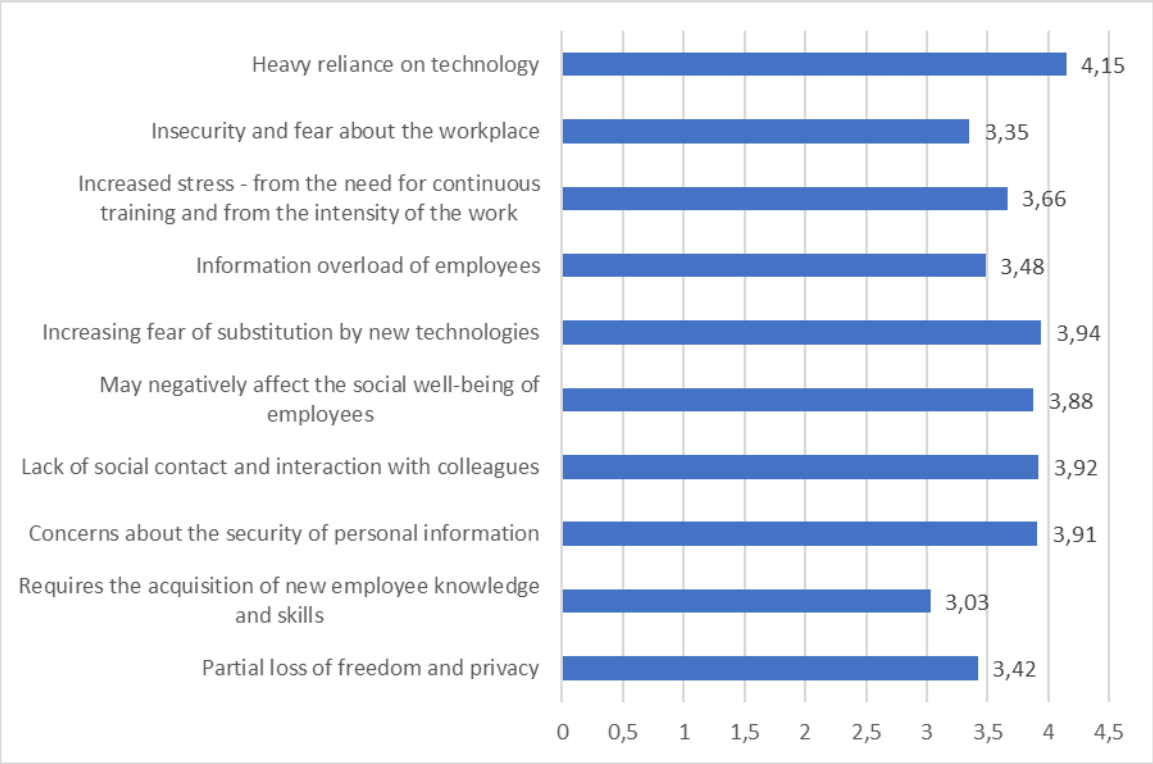

Fig. 10. Average score by indicators of the main limitations for the employees in the process of usage AI in HRM

The last question again contains the assessment on the relation between usage of AI at work and its impact on different elements of the business organizations. The responders were asked to assess the impact in 5-point Likert scale, where 1 is very negative and 5 is very positive. Final results from this assessment, after additional calculation for the average score in each element, are presented on fir. 11.

Evident from the results, it can be concluded that the students have a very sober view when it comes to the impact that AI has on the various elements of the business organization. According to our respondents, the three elements from the business organization that AI most positively impacts are: the image of the company (with average score of 3,93 in maximum 5,00), followed by organizational culture (3,39) and ethics in organization (3,15). At the same time, it has to be noticed that these average scores are almost in the middle of the rating scale rather than towards the visible positive rating. The top three elements of the company with negative impact on AI are as follows: level of professionalism (2,22), employee relations (2,36) and relationship between managers and employees (2,52).

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Fig. 11. Average score from the assessment on the impact between AI and different company`s elements

The obtained results on the attitude of young people could be considered as rather interesting and partly surprising due to the fact and usually young people are open to innovations, easily accept changes and are willing to explore new horizon. At the same time these results are indicators for the challenges and additional future work that has to be done in order to achieve balance between employee's expectation and level of digitalization and usage of AI.

5. Conclusion and recommendations

We usually perceive young people as carriers of change, with an eye towards new horizons. In this article, we investigated the attitude of students from seven leading Bulgarian universities to digitalization and, more specifically, to the use of artificial intelligence in human resource management. The results of our research indicate that students are still skeptical and would not generally trust only AI-based career development solutions. As representatives of the future generation of employees and managers, their opinion is important and innovative companies should take it into account when developing effective strategies to ensure on the one hand the use of AI and digitalization, on the other hand - data protection and the possibility of development and creativity of the individual employee. Constructed in this way, a human resource management strategy of an innovative business organization will be able to generate sustainability of results in a strategic plan.

Obtained results from the empirical research give us solid information, that in fact confirm our initial hypothesis that the majority of young people consider digitalization and AI in HRM as a natural part of the development of the modern business company. On the other hand, however, this initial support that young people demonstrate towards new technologies and their use for HRM purposes is not automatically generated. Young people who have grown up in a digital environment have a very clear idea and a very clear understanding of the limitations and to some extent the real threats that can arise in a work environment. As employees, they largely accept the possibility of being hired by AI-assisted selection, but on the other hand, they would find it difficult to accept any career development decisions based solely on AI without human intervention. This fact partly confirms and partly rejects our second hypothesis, namely: The majority of young people accept using AI in HRM, including in recruitment activities and control.

Based on the findings of our research, we developed and propose several useful solutions that could be used in the development of HRM strategy which adopted AI, as follows:
- to strengthen the role of the line manager in the integration of HRM tools using AI. This should be reflected in several directions: a stronger opportunity for direct communication between manager and employee; to enable a final manager decision based on the information collected and analyzed by AI, especially regarding decisions related to career development, training opportunities, etc.;
- to strengthen the internal organizational culture development policy by building a supportive environment for employees. Currently, young people believe that the use of AI brings more public image to the company than to support and develop the organizational culture, which can be considered an insufficiently and under-developed so far opportunity;
- parallel to the process of adoption of AI for the purposes of HRM, to conduct a targeted internal information campaign for employees, in which the benefits that each employee will have from their introduction are very clearly explained. For example, training opportunities, opportunities for impartial and somewhat transparent evaluation of work should also be very clearly highlighted, as they are one of the undeniable advantages of digitization in general.

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