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Artificial Intelligence in Industry 4.0: The future that comes true: AI

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A Comprehensive view of the Application of AI in Recruitment and Selection

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Abstract: *Using AI through industries and business processes is increasingly becoming the subject of theorists and practitioners. In the HRM process, the use of AI gives companies numerous advantages in employee performance, and processes, but also presents them with organizational, financial, technical, legal, and personnel challenges. This paper explores the application of AI systems in recruitment and selection through gamification strategies, people analytics, talent intelligence, AI platforms, video interviews, and conversational AI. It provides an overview of the benefits and challenges associated with their implementation. Additionally, the paper delves into ethical considerations and legislation, focusing on the EU Act, domestic laws, and ISO AI standards. The primary goal of this paper is to provide a comprehensive understanding of AI's role in HR processes and the complexities of implementing AI solutions in recruitment and selection.*

Keywords: *AI application, recruitment, selection, ethical consideration, legal regulation, benefits, challenges*

1. Introduction

The implementation of Industry 4.0 technologies in human resource management processes is leading to significant changes in the way work is approached. Changes related to the way of work include strategic changes in the organization of the human resources management function, which refer to changes in the way of hiring, evaluating and retaining existing employees, creating an innovative and digital organizational culture. These changes also refer to the application of new concepts in HR such as gamification, people analytics and managing a multigenerational workforce and employee experience. When considering changes in human resource management [1], it is crucial to prioritize the digitization of HR activities and provide retraining and additional training for HR employees, particularly in digital and analytical skills. HR professionals should be deeply involved in all aspects of HR digitalization, ensuring alignment with the company's goals. HR business partners need to

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work closely with business leaders to align HR strategies with business goals, requiring digital skills in Industry 4.0. Operational managers should also have more decision-making authority, which will help decentralize decision-making. They can utilize digital tools for activities such as recruitment and performance management, in order to enhance efficiency and decision-making.

Meanwhile, HRM is responsible for ensuring that the workforce is equipped to adopt these technologies in different business processes through training, talent development, recruitment, and retention practices.

AI in HR processes can be used in different sub-processes of the HR process (Figure 1).

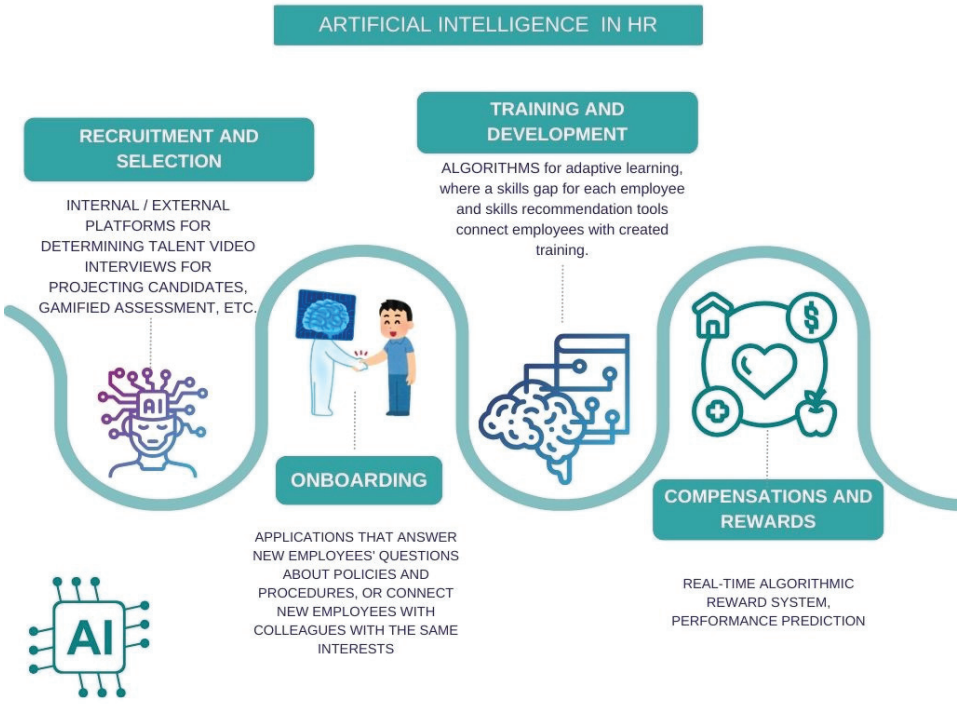


Figure 1. Artificial intelligence in HR processes

The applications of AI in HR processes outlined in Figure 1. represent some of the most prevalent uses. It is essential to understand that these applications are continually expanding in various ways. The advancement of both general and generative artificial intelligence, along with its integration with other Industry 4.0 technologies, broadens the range of its potential applications.

Research [2], shows some interesting trends in examples of AI in companies in the sense that senior executives believe (81%) that digital transformation, the needs of employees for flexible working conditions, and the lack of talent will

make the process of talent planning significantly more challenging in the coming period. Also, most of them (78%) believe that their organizations may not be able to do the processes of retraining employees quickly enough to the requirements of technology application in the next three years. That makes the process of talent management especially difficult. In contrast to this research, when it comes to generative AI, Deloitte's research [3, p.19-20], shows that companies are aware that the application of generative artificial intelligence will require major changes in talent management strategies, and 47% of respondents stated that they are investing high efforts in educating their employees on the application of generative AI within their positions. These efforts are related to the recruitment and engagement of technical talents to launch generative AI initiatives, the education of the existing workforce and the benefits and risks of applying generative AI, as well as reskilling of those employees who are most amenable to the use of generative AI. The same survey reveals [3, p.13] low adoption of generative AI in HR, with only 23% of respondents having adopted gen AI in HR, compared to 41% in marketing and sales, product development, and production.

2. AI in Recruitment and Selection

Artificial intelligence is leveraged in human resources through different applications and platforms for attracting and recruiting candidates, as well as talent intelligence [4], gamification and people analytics [5, 6, 39].

Chatbots

The simplest and most widely used AI application in recruitment and selection is *Chatbots* a communication AI tool to provide information to candidates regarding the position they are interested in and information about the company, policies, and procedures. Companies use this form of AI because, in addition to answering candidates' questions in real time, the chatbot can simultaneously process various inquiries, schedule interviews, and provide feedback to candidates regarding their applications. The automation of routine tasks in recruiting improves efficiency and enhances the candidate experience [7]. The user experience depends on the design and functionality of the AI tool itself, as well as its ability to personalize responses and the human element that is of particular importance for the experience of Generation Z as users of this AI tool [8]. AI chatbots are unable to make decisions, but they can assist recruiters. Implementing a conversational AI system [9](commonly known as a chatbot) to handle tasks such as recording, reviewing, and scheduling interviews can result in significant time and cost savings in the hiring process. Additionally, it can contribute to a higher retention rate of new employees. Automation in these

activities improves the human resources sector by leaving time and space for more creative activities and provides users with a better user experience.

People analytics

People analytics can be classified into different levels of maturity: descriptive, predictive, prescriptive, and autonomous analytics. The key distinction among these maturity levels lies in how data is utilized. Descriptive analytics is used to analyze and understand performance, predictive analytics is used to forecast future performance based on identified patterns, and prescriptive analytics is used to make suggestions for decisions based on the results of predictive analytics. Descriptive analytics, for instance, can help in identifying the most effective source of candidate recruitment, factors influencing a candidate's success in a specific position, and the efficiency of the recruitment process, including any bottlenecks. Empirical studies [10] indicate that predictive analytics for forecasting candidate achievement before CV screening, based on historical information about employees, their performance, and attributes, can significantly reduce recruitment expenses. This is because it helps exclude candidates who lack key characteristics for a certain position even before the CV screening stage. The use of prescriptive analytics through the use of statistical algorithms and machine learning models can significantly improve the prediction of the need for employment, and based on the analysis of historical data, discover patterns that with a high probability predict the success of candidates for a given position before employment [11] and recommend and personalize the strategies of attraction, recruitment, selection and retention. Autonomous human analytics "autonomously makes and executes decisions based on a self-learning algorithm, without human insight"[12]. When it comes to autonomy in decision-making, descriptive and predictive analytics applications can be used as decision support. Prescriptive analytics, although highly influential in decision-making with a high probability that the proposed actions will be adopted, still leaves the autonomy to the people. On the other hand, in autonomous analytics, a large part of the process is automated without human interaction.

Although the benefits of using people analytics are numerous, there are also certain disadvantages of using people analytics, such as [12]:

1. excessive reliance on analytics can negatively affect managerial abilities (cognitive abilities of critical thinking, independent interpretation of situations and reasoning) reducing their decision-making autonomy,
2. negative impact on employees (through the mechanization of thinking, reduction of cooperative decision-making, reduction of direct communication),

3. insufficient transparency and understanding of the functioning of AI algorithms and lack of clear responsibility,
4. reduction of innovation, flexibility and the need to adapt to changes due to excessive dependence on the established path of historical orientation,
5. bad decisions due to the illusion of algorithm control and data quality,
6. taking predictions as self-fulfilling prophecies.

Talent Intelligence

In addition to people analytics, which takes into account internal data, a special use of AI in recruitment and selection is talent analytics, which combines an organization's internal data with external data from the market based on a skills-based approach, to assess the needs of companies in the field of labor and the business development goals. Its benefits in recruitment are more efficient workforce planning, more agile access to talent, and reduction of recruitment costs. One of the most well-known AI platforms for TI is the Eightfold Talent Intelligence Platform based on deep-learning AI models, which aims to find qualified internal and external candidates and fill the gap in talent availability, with unbiased selection with a personalized experience. Many companies use this AI platform[13] to find, select, develop, and retain talent.

Gamification

Gamification is „the application of game elements in a non-game context“ [14], which aims to achieve benefits related to the performance indicators of the processes in which the game is applied. Thus, within the human resources framework, gamification is most often used in recruitment and selection, onboarding, training and development, and to ensure the well-being of employees [1]. In the selection process, gamified assessments are interactive, objective, and inclusive assessments of the candidate's skills and behavioral characteristics. The design of games helps ensure interactivity and increases candidates' motivation to participate. The gamified assessment measures various behavioral, numerical, motor, and cognitive abilities without candidates being mindful of what is being evaluated. This provides employers with unbiased and objective insights into individual candidates. Unlike conventional assessments, where candidates can easily tailor their answers to fit socially acceptable behavior, gamification avoids this bias by not revealing what is being measured.
Thus, using game design elements related to: "self-presentation, social interaction, immersive and engagement, self-challenges and challenges to others, choices and unpredictability" [5], companies can gain insights into the candidate's abilities for specific positions. Some research shows that the choices of game elements and game design are closely related to the results of the game

in the learning process [6]. The AI-based algorithms behind these games facilitate the selection of suitable candidates based on pre-defined selection criteria.

AI video interview

Candidate selection based on AI video interviews and gamified assessments provided by various providers (Spark Hire, Hire Vue, Pymetrics, ZenHire, and others) is increasingly used by companies of various sizes. These providers combine insights from psychology and behavioral economics with technological know-how from ML, neural networks, and deep learning to create their AI tools. In the selection, predictive analytics is used, where, based on the predictive assessment of talents, a comparison can be made with the job profile as a set of competencies that positively affect job performance[15].

Some of these AI systems are focused on specific areas of business (Business Process Outsourcing, Call Centers), enabling the *automation of workflows* from position advertising, CV review, AI interviews, interview scheduling, *personalized feedback to candidates* with suggested opportunities for improvement (through a personalized video by HR which has a positive effect on the employer brand and a high Net Promoter Score where employees become promoters of the company), *customized testing with the assessment of skills and abilities* characteristic of the respective roles, as well as a *significant level of real-time analytics for various employee performance metrics or recruitment sources, etc*. [16]. Apart from AI systems oriented towards specific niches in recruitment and selection, there are others more generalized concerning the niche criterion. These AI systems assess candidates' skills, abilities, and attitudes, can measure attributes for different jobs, and analyze the most important ones for a given job. AI system can evaluate job attributes related to work style and personality type (through reliability, initiative, flexibility), domain knowledge and skills, candidate's ability to work with information and data (cognitive abilities and problem-solving skills), ability to cooperate with people (through the skills of emotional intelligence, communication, and negotiation) [17]. That assessment of the candidate can be done in the form of a game an AI-supported interview or a combination thereof. Gamification in selection occurs in psychometric games lasting no more than 15 minutes per game, which measure cognitive abilities, emotional intelligence, and personality characteristics[17]. AI Video interviews are used to assess the skills, abilities, and attitudes as well as personality traits of candidates, based on AI speech analysis [17].

Certain AI systems in terms of transparency provide users and the public with information (Explainability statement) by which they are described in more detail [18]:

1. The purpose of AI systems such as video interviews used as decision support tools in employment, is to help recruiters effectively and efficiently find qualified candidates. This is achieved through the use of an AI algorithm that aims to avoid or minimize human biases in the assessment process.
2. The way of using the meaning of AI techniques and factors - The way to ensure this is to control and test the biases of only the algorithm in each of the phases of the algorithm's life cycle following legal procedures, so if possible biases are noticed, then it is possible to minimize those data points. An explanation of how the tool ensures consistency in interviewing (by avoiding recruiter bias), equal opportunities (all candidates have the opportunity to interview at a time and place that suits them), and how it manages the candidate experience (through the possibility of re-answering if the candidate is not satisfied with their previous speech, an evaluation report as feedback).Companies can modify the AI solution in part of the data set used and their estimated impact on the assessment results.
3. Design of an AI solution that includes: *converting words into text* using the ML model, *understanding individual words and complete sentences* using the NLP model, *evaluating and scoring each candidate* using a regression ML model that evaluates the candidate's answers according to the competencies that the company wants to examine in the evaluation.
4. Such explanatory statements include information on how and when the AI system is tested, how the risks are managed, how AI suppliers are chosen to create solutions and how to cooperate with third parties, how system changes are made, and how and who performs system audits.

It's important to understand that these statements on explainability highlight the need for AI system providers, users, and other stakeholders to comprehend how the AI system functions so they can provide input on whether to accept or reject the system. Trust in AI systems is low because it's difficult to explain how they work and predict their strengths and weaknesses. Legal regulations require everyone involved in creating and using AI systems to align their practices with legal requirements. As a result, we can expect to see more similar documents (such as strategies, statements, rulebooks, and procedures) in the future.

2.1. Benefits and Challenges

It is crucial to thoroughly evaluate the role of artificial intelligence in the recruitment process to gain a comprehensive understanding of its functionality,

including the advantages, challenges, and potential risks for the organization, its employees, and other stakeholders.

Table 1. The benefits and challenges of AI in recruitment and selection

BENEFITS
➢ More effective candidate assessment through improved candidate matching [19] ➢ Greater recruitment efficiency [20] ➢ Automation of parts of the recruitment process (CV review) [9] ➢ Low employment costs [22] ➢ Reduced the bureaucracy of HR and time and cost in the process of selecting candidates [22] ➢ Minimized human bias [23] ➢ Improved user experience through more dynamic and early interaction with hiring managers[24] ➢ Hiring based on skills and abilities, not based on a resume [24] ➢ Higher employee satisfaction and better performance with better NPS (Net Promoter Score) [16] ➢ Increased diversity and equality in employment ➢ Strengthened the employer brand
CHALLENGES
➢ Data privacy and security [21, 19] ➢ Fairness and unbiased AI algorithms [21] ➢ Algorithmic equity in uniform environments, such as talent acquisition in IT where an AI system is deployed [23] ➢ Upholding non-discrimination and human rights principles [19] ➢ Data quality and validity ➢ Transparency of the algorithm ➢ High costs of development and utilization ➢ Organizational and technological readiness for adopting AI solutions ➢ Candidates' willingness to use (regard for data privacy and trust in the data management system).

It is crucial to prioritize the integration of AI systems into legal procedures. However, due to the complexity involved in developing and using AI systems, including technical, organizational, and employee competency factors complying with legal regulations may take longer and be more costly. This could significantly slow the progress and adoption of AI systems.

2.2. Ethical Considerations and Legal Regulation

When considering the ethical use of AI and adherence to legal regulations in the hiring process, the main challenges lie in safeguarding human rights and complying with the legal standards of the markets where the AI tool is employed. As per a study by researchers [25], the primary ethical concerns raised by both businesses and job seekers regarding the use of AI in recruitment include:

1. AI algorithm biases that can compromise the principles of *non-discrimination* [23]. The AI system should promote fairness and eliminate any kind of bias, but if the data used to build the algorithm contains biases or reflects socioeconomic inequalities, then the AI system results in an unfair outcome [26] when the data set on which the AI model is trained is dominated by one certain race or sexual orientation [27];
2. *Preservation of human autonomy* in decision-making, because automated decision-making is also problematic from a legal and practical point of view.
3. The degree of *validity* of predictions based on data (because, unlike humans, AI cannot recognize complex emotions or assess the impact of certain candidate abilities such as charisma on job performance, does not understand the candidate's value system, etc.);
4. Adequate *data management*, especially in the domain of *privacy and security*;
5. *Transparency of AI solutions in decision-making* because an explainable AI system enables users to trust and minimize harmful decisions [26].

To detect AI algorithm bias problems (bias in a non-representative data set used for training AI solutions or machine learning models), companies use tools for detecting and minimizing bias [23] such as What-If Tool, Fairlearn, AI Fairness 360 (AIF360), FactSheets for AI, Audit-AI algorithm bias detection tool. These tools can be in different forms from open source applications where according to multiple fairness metrics the ML model is tested using the visualization of the analyzed ML model and in the form of a What-if tool to examine the model in different scenarios of data sets and subsets [28] or audit tools ML models and in all - "detection and minimization of discriminatory patterns in data training and machine learning predictions for socially sensitive decisions" [29].
In the European Union countries, regulations regarding artificial intelligence (AI) are based on the Regulation on Artificial Intelligence (AI Act) as well as legal procedures governing labor relations and data privacy. In Serbia, there is no specific legal regulation concerning the use of AI in employment. However,

indirect regulation occurs through compliance with laws such as the Personal Data Protection Act, the Labor Act, and the Anti-Discrimination Act.

Regarding the Personal Data Protection Act, special attention in AI solutions should be focused on the basic principles of personal data protection [30, p.55] (legality, fairness, transparency, limitations concerning the purpose of processing, minimization of personal data, completeness and accuracy, limited storage of personal data, integrity and confidentiality, operator's responsibility for actions related to personal data) and individual rights related to the protection of personal data [30, p.90] (right to information, right to access, the right to correction, the right to be forgotten, the right to limit processing, the right to transfer, the right to object and rights related to automatic data processing). In the realm of employment solutions, the integration of artificial intelligence (AI) in handling personal data must adhere to data protection principles to ensure lawfulness, fairness, and safeguarding of individual rights. This necessitates a legal foundation for the collection and processing of data, typically exemplified by the candidate's consent for data collection or the requirement to fulfill a specific agreement. The AI solution should adopt an impartial, non-discriminatory approach, devoid of bias towards candidates during their tasks. In terms of transparency, candidates should receive clear information regarding the entity collecting the data and their methods for processing, utilization, and storage of the data. According to this Law, data processing operations may be undertaken only for *specific, explicit, and justified purposes* [30, p.66], e.g. for recruitment selection, and may not be used for other purposes without the additional consent of the candidate. The *principle of minimization of personal data* in the employment context refers to the use of the smallest possible amount of data about the candidate, mainly the information related to the assessment of the candidate's suitability for the required position during recruitment. The *principle of data storage limitation* refers to the period in which the collected and processed data about the candidate is stored. When the purpose for which the data was collected and processed is fulfilled, the need to save the data disappears, that is, the basis of the processing is lost and the data must be deleted. Integrity and confidentiality in data processing to prevent abuses are achieved mostly through adequate personnel and technical and organizational security measures. The aim is to prevent losses, damages, or other errors that may arise from data processing. The *principle of responsibility* refers to the obligation of the person who collects, processes, and stores data to do so following legal requirements. This responsibility is expressed through internal procedures such as "personal data protection strategy, creation of internal procedures related to the method of data processing, mapping of activities related to personal data, determination of the person authorized for data protection or other persons who are responsible for personal data, - ensuring appropriate training of employees in connection with the protection of personal

data, rulebook related to efficient management of personal data breaches, impact assessments in special cases of processing, control of implemented measures" [30, p.75]. Apart from the Law on the Protection of Personal Data, AI applications should be harmonized with the regulations from the Law on Prohibition of Discrimination [31] based on gender, ethnic and racial affiliation, religion, disability, age, and sexual orientation in the field of work, which guarantees equal employment opportunities and equal rights (Article 16) such as "the right to work, to free choice of employment, to advancement in the service, to professional training and professional rehabilitation, to equal remuneration for work of equal value, to fair and satisfactory working conditions, to rest, on education and joining a trade union, as well as on unemployment protection".

The EU AI Act classifies the application of AI in employment (recruitment and selection) and employee management (working conditions, assignment of tasks, authorizations and responsibilities, evaluation and promotion of employees, termination of contractual relations) as high-risk systems [32], because these systems may have significant impact on the career, financial, physical and psychological well-being and human rights of employees. Algorithms can lead to issues regarding the protection of candidates and employees from discrimination, as well as data privacy.

AI systems classified as high-risk must adhere to specific requirements, including[33]:

- Establishing, documenting, and maintaining a comprehensive risk management system throughout the life cycle of the AI system
- Managing data to ensure the provision of high-quality datasets for developing, evaluating, and testing AI solutions
- Developing and maintaining thorough technical documentation outlining system design, advantages, limitations, and compliance with the requirements stipulated in the AI Act
- Automatically recording the traceability of the functioning of the high-risk AI solution throughout its entire life cycle
- Ensuring transparency of user instructions in digital format, providing comprehensive, accurate, clear, and user-friendly information
- Providing human supervision through an appropriate human-machine interface to mitigate risks related to data, health, or user safety and ensuring robustness, accuracy, and cybersecurity throughout the life cycle of AI solutions.

The EU AI Act also prescribes the obligations of users and suppliers of high-risk AI systems [34]. In the hiring process, most companies are like users, as developing their own AI solution is a financially, organizationally, and personnel-demanding project. It's their responsibility to ensure they have the necessary organizational and technical requirements for the correct use of high-risk AI systems according to the provider's instructions. They should assign the

supervision of the system to a knowledgeable and skilled employee, providing them with technical support. Continuous monitoring of AI systems for potential risks and timely notification of suppliers in case of any risks occurring is crucial. Additionally, automatic logs generated by high-risk AI systems should be kept for at least six months, unless otherwise specified in the legal regulations on personal data protection. If, on the other hand, a certain company decides to develop its own AI solution in the field of employment that is marked as high-risk, or if it significantly modifies someone's solution that is already in use on the market, then it will be considered a provider of a high-risk AI system [35] and will have the obligation of adequate risk management, documentation through the maintenance of an automatic diary, the implementation of a QMS system, undertaking corrective actions and cooperation with regulatory bodies, training the system on quality data that excludes biases and encourages fairness in decision-making. When developing high-risk AI systems, organizations must have a QMS meeting EU Act requirements for policies, procedures, and instructions [36] which refers to:

- strategies whose main goal is to comply with regulations through procedures for managing modifications of AI systems and procedures for assessing compliance with regulatory requirements,
- procedures concerning the projection control and verification of AI system design,
- procedures related to quality management in terms of development quality control and quality assurance of AI systems,
- testing, testing, and validation procedures of AI systems, before during development, and after development,
- technical documentation and specification as well as applicable standards
- procedures related to data management (collection, tagging, storage, analysis, filtering, mining, aggregation, retention)
- procedures related to the risk management system (establishment, implementation, documentation, and maintenance) as a process of continuous improvement through the life cycle of the AI system. This system should cover potential risks to fundamental rights, health, and safety. These risks should be identified, analyzed, and defined and adopted measures for their management.
- procedures for monitoring AI systems on the market and reporting incidents,
- procedures for managing communication with all interested stakeholders
- procedures for clearly establishing authority and responsibility for employees regarding the AI system
- procedures for keeping records of relevant information and documentation

Companies that develop, provide AI products and services, modify and use AI have at their disposal various guides for the responsible creation and use of AI systems, and among the most important are the standards of the International Organization for Standardization [37] ISO/IEC 42001:2023, ISO/ IEC 23894:2023, ISO/IEC 23053:2022, ISO/IEC 27701:2022. AI Management System Standard ISO/IEC 42001:2023 contains requirements and guidelines for the establishment, implementation, maintenance, and continuous improvement of AI systems. The goal is to ensure the responsible development and use of AI systems from the point of view of ethical norms, transparency, and continuous improvement. It is intended for organizations that not only develop an AI system but also use it, regardless of the size and form of the organization. The requirements of the standard include special requirements in terms of risk management in autonomous decision-making, data analysis, and ML, as well as AI system training. ISO/IEC 23894:2023 refers to the risk management of AI systems and is particularly important as a support for meeting the requirements of the EU Act because it provides specific instructions on how to identify risks and how to effectively manage them. This is a guide based on which organizations can develop their practices and procedures for identifying, assessing, and mitigating the risks of AI systems, to ensure that the system is fair and non-discriminatory, secure from the point of view of data security and privacy, that it is robust and does not produce negative effects, and of course transparent in terms of decision making. The ISO/IEC 23053:2022 standard is a framework for understanding AI systems based on machine learning by explaining how to solve problems by building, testing, modifying, and evaluating ML models, using a variety of data (related to training, validation, testing, and use) and software tools and techniques (for data preparation, the definition of algorithm category, optimization methods, and ML model evaluation criteria) [38]. ISO/IEC 27001:2022 refers to the management of information, privacy and cyber security and their alignment with legal frameworks.

When talking about the ethical use of AI systems, it is important to emphasize that it is achieved through education about ethical concerns, cases of ethically problematic AI systems, legal frameworks, and requirements regarding the ethical repercussions of AI systems, as well as through the design and implementation of strategies, procedures, and rules. development or use of the AI system, audits, and reviews for each phase of the life cycle of the AI system.

3. Conclusion

It is important to understand that AI requires significant organizational changes in processes. This necessitates a highly qualified workforce and additional financial investments. The benefits of utilizing artificial intelligence in hiring and choosing candidates are apparent in improved organizational, financial, market, and operational outcomes. Along with the benefits, it's important to consider the obstacles and the legal requirements that companies must meet if they opt to adopt AI solutions or create their own. Approaching the sustainable use of AI in business processes involves a mix of legal regulation, technology, and ethical standards. With the complexity of AI systems, there is a growing need to ensure transparency, validity, fairness, decision-making autonomy, and accountability. This necessitates the association and inclusion of many stakeholders in the AI system development process, which may complicate the fulfillment of EU AI Act standards and slow down the development of these systems. It is also necessary to assess the long-term effects of AI systems on employees and the labor market. Companies require a competent workforce with cross-functional knowledge to audit compliance with the requirements of AI system providers, suppliers, and users. Enhancing employees' skills in this area will be a top priority in the upcoming period. Therefore, when it comes to applying AI systems, it is essential to take a comprehensive approach to understanding both the possibilities and limitations of AI to make informed decisions.

4. References

[1] Dreković E, Teofilović Ž. (2024). A chapter Upravljanje ljudskim resursima kao kritični faktor digitalne transformacije preduzeća, in a book“Industrija 4.0: digitalna transformacija oblikuje budućnost” (Karabegović I. i Majstorović V.), Društvo za robotiku u Bosni i Hercegovini and Akademija nauka i umjetnosti Bosne i Hercegovine, ISBN 978-9958-9262-8-0 , ISBN 978-9926-410-94-0, pp 371-394

[2] World Employment Confederation (2023). Agile talent in the age of AI. https://insights.wecglobal.org/the-work-we-want/home/agile-talent-in-the-age-of-ai [Accesed:17.07.2024]

[3] Now decides next:Insights from the leading edge of generative AI adoption Deloitte’s State of Generative AI in the Enterprise Quarter one report. (2024). Deloitte Development LLC https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-state-of-gen-ai-report.pdf [Accesed:17.07.2024]

[4] Eightfold.:Unlocking the power of Talent Intelligence: A definitive guide.(2024). https://www.youtube.com/watch?v=jiXj6YB8lhE&t=1159s

[5] Bina, S., Mullins, J., & Petter, S. (2021). Examining game-thinking in human resources recruitment and selection: A literature review and research agenda. https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/3fa22381-291c-48ca-9ec9-1554622d5e7e/content

[6] Kulkarni, P., Gokhale, P., Satish, Y. M., & Tigadi, B. (2022). An empirical study on the impact of learning theory on gamification-based training programs. Organization Management Journal, 19(5), 170-188, p.183.

[7] Koivunen, S., Ala-Luopa, S., Olsson, T., & Haapakorpi, A. (2022). The March of Chatbots into Recruitment: Recruiters' Experiences, Expectations, and Design Opportunities. Computer Supported Cooperative Work (CSCW). https://doi.org/10.1007/s10606-022-09429-4

[8] Kumar, S., Chaurasia, M., & Singh, P. Ai based chatbots in recruitment: Generation Z users experience. Manager - The British Journal of Administrative Management ISSN - 1746 1278 Volume 59 Special Issue 01 Feb 2023

[9] HireVue. Case studies. https://www.hirevue.com/case-studies/national-safety-apparel [Accesed: 13.08.2024]

[10] Jayanti, L. P. S. D., & Wasesa, M. (2022). Application of Predictive Analytics To Improve The Hiring Process In A Telecommunications Company. Jurnal CoreIT, 8(1), 32-39.

[11] Pessach, D., Singer, G., Avrahami, D., Ben-Gal, H. C., Shmueli, E., & Ben-Gal, I. (2020). Employees recruitment: A prescriptive analytics approach via machine learning and mathematical programming. Decision Support Systems, 134, 113290.

[12] Lisa Marie Giermindl, Franz Strich, Oliver Christ, Ulrich Leicht-Deobald & Abdullah Redzepi (2022) The dark sides of people analytics: reviewing the perils for organisations and employees, European Journal of Information Systems, 31:3, 410-435, DOI: 10.1080/0960085X.2021.1927213

[13] Eightfold Talent Intelligence Platform. https://eightfold.ai/customers/customer-stories/ [Accesed: 6.08.2024]

[14] Armstrong, M.B. and Landers, R.N.: Gamification of employee training and development. International Journal of Training and Development, Vol. 22 No. 2, pp. 162-169.(2018).

[15] SparkHire. Predictive Talent Assessments. https://www.sparkhire.com/predictive-talent-assessments/ [Accesed: 15.08.2024]
[16] ZenHire. https://zenhire.ai/ [Accesed: 15.08.2024]
[17] Nathan Mondragon, Kiki Leutner, Josh Liff, Lindsey Zuloaga (2020). The next generation of assessments, White paper. Hire Vue.
[18] Simmons & Simmons and Jacob Turner (2022). HireVue AI Explainability Statement. HireVue. https://www.hirevue.com/ai-in-hiring [Accesed: 20.08.2024]
[19] Asif, A. (2024). Integrating AI in Recruitment: A Review of Perceptions, Acceptance, Adoption and Ethical Considerations of AI Usage. Frontiers in Business, Economics and Management, 15(3), 108-115.
[20] Albassam, W. A. (2023). The Power of Artificial Intelligence in Recruitment: An Analytical Review of Current AI-Based Recruitment Strategies. International Journal of Professional Business Review, 8(6), e02089. https://doi.org/10.26668/businessreview/2023.v8i6.2089
[21] Han, L. (2024). Changes and Challenges of Recruitment Models in the Era of Big Data Intelligence. Journal of Education and Educational Research, 7(3), 33-36.
[22] Blumen, D., & Cepellos, V. (2023). Dimensions of the use of technology and Artificial Intelligence (AI) in Recruitment and Selection (R&S): benefits, trends, and resistance. Cadernos EBAPE. BR, 21, e2022-0080.
[23] Yarger, L., Cobb Payton, F., & Neupane, B. (2020). Algorithmic equity in the hiring of underrepresented IT job candidates. Online information review, 44(2), 383-395.
[24] HireVue. Case studies. https://www.hirevue.com/case-studies/gsb [Accesed: 13.08.2024]
[25] Hunkenschroer, A.L., Kriebitz, A. Is AI recruiting (un)ethical? A human rights perspective on the use of AI for hiring. AI Ethics 3, 199–213 (2023). https://doi.org/10.1007/s43681-022-00166-4
[26] Konidena, B. K. ., Malaiyappan, J. N. A. ., & Tadimarri, A. . (2024). Ethical Considerations in the Development and Deployment of AI Systems. European Journal of Technology, 8(2), 41–53. https://doi.org/10.47672/ejt.1890
[27] Fernández, C., & Fernández, A. (2019). Ethical and legal implications of AI recruiting software. Ercim News, 116, 22-23.

[28] Wexler, J., Pushkarna, M., Bolukbasi, T., Wattenberg, M., Viégas, F., & Wilson, J. (2019). The what-if tool: Interactive probing of machine learning models. IEEE transactions on visualization and computer graphics, 26(1), 56-65.
[29] Audit-AI. Pymetrics. https://github.com/pymetrics/audit-ai [Accesed: 10.8.2024]
[30] Andonović, S., & Prlja, D. (2020). Osnovi prava zaštite podataka o ličnosti.
[31] Zakon o zabrani diskriminacije ("Sl. glasnik RS", br. 22/2009 i 52/2021). https://www.paragraf.rs/propisi/zakon_o_zabrani_diskriminacije.html [Accesed:20.07.2024]
[32] The EU AI Act. Article 6: Classification Rules for High-Risk AI Systems. https://artificialintelligenceact.eu/recital/57/ [Accesed:25.07.2024]
[33] The EU AI Act. Section 2: Requirements for High-Risk AI Systems https://artificialintelligenceact.eu/section/3-2/ [Accesed:25.07.2024]
[34] The EU AI Act. Section 3: Obligations of Providers and Deployers of High-Risk AI Systems and Other Parties https://artificialintelligenceact.eu/section/3-3/ [Accesed:25.07.2024]
[35] The EU AI Act. Article 25: Responsibilities Along the AI Value Chain. https://artificialintelligenceact.eu/article/25/ [Accesed:25.07.2024]
[36] The EU AI Act. Article 17: Quality Management System. https://artificialintelligenceact.eu/article/17/ [Accesed:25.07.2024]
[37] ISO. https://www.iso.org/sectors/it-technologies/ai [Accesed:05.08.2024]
[38] Paul Cotton, Milan Patel, Wei Wei. (2022) The foundational standards for AI. https://jtc1info.org/wp-content/uploads/2022/06/03_08_Paul_Milan_Wei_The-foundational-standards-for-AI-20220525-ww-mp.pdf [Accesed:05.08.2024]
[39] Karmańska, Anna.: The benefits of HR analytics. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu. 64. 30-39.(2020).