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Algorithmic Discrimination in the Era of Artificial Intelligence: Challenges of Sustainable Human Resource Management

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Abstract

The purpose of the paper is to determine the role of the phenomenon of algorithmic discrimination in the processes of implementing smart technologies in HR, particularly in the context of sustainable management. To accomplish this task, the author conducted a scoping review of the literature. The study indicated a significant role of the described phenomenon in shaping employee opinions about artificial intelligence and emphasised the importance of sustainable people management in its utilisation. The research results call for deeper reflection on how to assess the performance of artificial intelligence and highlight that attempting to replicate human abilities in machines not only offers new possibilities but also carries the risk of perpetuating human imperfections. The limitations of the study arise from the small number of available empirical studies in this area. The article helps to understand the essence of artificial intelligence and contributes

to filling the knowledge gap regarding methods of managing people in the process of implementing smart technologies.

Keywords: Artificial Intelligence, algorithmic discrimination, SHRM, HR, Sustainable Management

JEL Classification Codes: M50, M12

Introduction

The rapid evolution of intelligent technologies and their expanding application in areas traditionally reserved for human intervention have elicited widespread social concerns. This technological advancement, particularly within human resources (HR), marks a significant shift from the initial deployment of expert systems in the 1990 s to a subject of intensified scholarly discourse in management sciences, as evidenced by bibliometric statistics. The integration of "Artificial Intelligence" and "Human Resources" in scholarly literature dates back to 1985, highlighted by Herman Hoplin's publication. However, there has been a surge in publications post-2020, reflecting the burgeoning academic interest in this intersection.

The momentum of this discussion is partly attributed to the pandemic era, which significantly altered work modalities, catalysing the adoption of modern technologies related to remote work and process automation. These hastily implemented solutions, driven by a concern for employee health and safety, have irreversibly transformed organisational landscapes, making technology an integral part of our daily lives. Market data confirm the enduring and escalating trend of technology development and application, including in HR, where a projected growth exceeding 15% is anticipated between 2023–2028.

A 2022 survey by the Society for Human Resource Management (SHRM) revealed that 16% of American organisations utilised this technology, with 85% of employees reporting enhanced productivity. Moreover, 20% of organisations are developing these systems, with an additional 25% planning to integrate AI into selected HR processes within the next five years. This growing interest and breadth of application necessitate an examination of the apprehensions it raises, the threats, and the dangers associated with its adaptation process. Despite the topic's popularity, there appears to be a lack of holistic sources that consider not just individual elements or identified threats but also their interrelations and connections. For instance, algorithmic discrimination, often cited as a threat or barrier, should be seen as an effect, not a cause, of complex operations.

The purpose of the paper is to determine the role of algorithmic phenomenon discrimination in implementing smart technologies in HR within the context of

sustainable management. In this context, it becomes significant to explore the real threats posed by implementing and using AI technologies in HRM, and to consider the role of sustainable people management in mitigating these risks. Considering the importance of technological changes and their potential impact on humans, addressing this topic is justified and framed within the need to organise knowledge about smart technologies, their advantages, and associated risks. To achieve this goal, the following research questions were posed:

1. What determines the negative or positive perception of AI within an organisation?
2. What is the role of SHRM in the AI technology adoption process?

To address these questions, a scoping review method was employed, synthesising knowledge to explore key concepts, evidence types, and research gaps in the studied area (Colquhoun, Levac, O'Brien, Straus, Tricco, Perrier, Kastner, Moher, 2014). This approach marks the first step towards highlighting the need to systematise terminology and key definitions used by researchers in this field.

Artificial intelligence in the context of sustainable human resource management

Sustainable Human Resource Management (SHRM) is a key response to the challenges faced by contemporary organisations in the context of rapid technological changes and increasing ecological awareness. Approaches to SHRM vary depending on the emphasis on specific internal and external outcomes (Kramar, 2014). Dyllick and Muff (2016) distinguish four types of SHRM: Socially Responsible HRM, Green HRM, Triple Bottom Line HRM, and Common Good HRM. The first focuses on long-term approaches and actions aimed at socially responsible and economically justified recruitment, development, utilisation, and dismissal of employees while preserving human capital. Green HRM focuses on environmental sustainability in business organisations by developing employees' ecological awareness and reducing the company's carbon footprint (Aust-Before Ehnert, Matthews, Muller-Camen, 2019). The Triple Bottom Line HRM approach aims to achieve environmental, social, and financial goals simultaneously, which aligns with the overall definition of SHRM. At the same time, Common Good focuses on solving global problems and represents a shift in understanding the purpose of business and the contribution of HRM, emphasising sustainable development and collective interests (Dyllick, Muff, 2016); thus, Common Good HRM places collective interests on par with organisational (Aust-Before Ehnert, Matthews, Muller-Camen, 2019).

The multidisciplinarity required by the sustainable approach brings organisational and analytical challenges. In this context, it is worth noting AI's potential, especially

in processing large data sets. Technology allows for practically unlimited exploration and analysis of the organisation and its environment, thereby integrating ESG goals in any configuration while optimising resources. AI can help automate and optimise recruitment processes, enabling faster and more objective matching of candidates to positions. Through advanced algorithms, it is possible to minimise the impact of unconscious biases and promote greater workplace diversity. Artificial intelligence can support individual employee development by personalising career paths and training programmes. Algorithms can analyse skills, preferences, and learning history to provide personalised educational resources and development opportunities.

AI tools can analyse engagement data and identify factors that affect their motivation and job satisfaction, enabling managers to make more informed decisions regarding HR policies and creating a more engaging work environment. Artificial intelligence can help monitor and support employees' mental and physical health through apps and platforms offering stress management or physical activity support. AI can contribute to better planning and human resource management, for example, by forecasting staffing needs, analysing workloads, optimising work schedules, increasing operational efficiency, and better matching tasks to employee competencies.

The potential of AI is undeniable, but the question arises whether there are effective methods to use these capabilities sustainably. Market examples suggest that this technology will cause significant changes in the labour market. According to the 27th PwC Global CEO Survey, a quarter of CEOs worldwide expect that implementing generative artificial intelligence will reduce employment by at least 5% in 2024. Goldman Sachs states that the latest breakthroughs in AI could lead to the automation of a quarter of the work done in the US and eurozone. In this context, actions within sustainable management seem particularly important. The lack of such actions or superficial actions toward sustainable management can undermine the social legitimacy of human resource management in an organisation and prevent access to valuable resources (including humans). This is possible if practitioners and scientists overlook the "paradigm shift of sustainable development" (Boudreau, Ramstad, 2005) or if the design and implementation of sustainable human resource management practices are ineffective.

Given the diversity of possible challenges facing HRM, it is worth paying attention to the research work of the Faculty of Management at the Warsaw University of Technology (WUT) on operationalising the concept of sustainable management when defining SHRM goals. The researchers from WUT used an approach based on integrated management with elements of the classical law of harmony in this case. Integrated, encompassing all concepts, methods, and management techniques useful to the organisation. Harmonious, i.e., effectively distributing emphases in applying selected concepts, approaches, and techniques (Zawiła-Niedźwiecki, 2014). This

idea refers to the classical law of harmony in organisation theory. It allows for a broader view of SHRM goals without negating any of the proposed approaches or the goals defined by them. The key to efficient AI application in SHRM service is awareness of the risks and challenges associated with technology and planning the goals of implementing this technology in line with sustainable development objectives. As suggested by research findings, optimal work outcomes are achieved through collaboration between humans and machines, which seems consistent with sustainable development ideas.

Research methodology

To address the research questions posed, the scoping review method was utilised, enabling rapid mapping of key concepts in the studied area, especially when it is characterised by complexity and has not been thoroughly investigated previously (Mays, Roberts, Popay, 2001). This method allows for identifying key concepts, their interpretative range within the researched area, and the indication of the sources of the examined content (Daudt, Mossel, Scott, 2013). A scoping review is justified in this case, allowing for a systematised synthesis of knowledge regarding existing gaps (Tricco et al., 2018), which can form a basis for defining future research directions. As M. Ćwiklicki (2020) states, it is a method applied when the research area is not precisely defined and descriptions in scientific publications are scattered. In this case, the procedure according to Arksey and O'Malley (2005) was applied, comprising six elements. The first is the formulation of research questions, followed by identifying relevant sources, selecting studies and their registration, compilation, and reporting of results, and the last, optional element concerns consultation of results, which was omitted in this case. The procedure was verified using a control checklist for methodological aspects according to the modified PRISMA methodology (Ćwiklicki, 2020).

The full-text Web of Science database was used to conduct the study due to its accessibility and the fact that it includes recognised scientific publications with specialised journals on the subjects studied. The functionality of the search engine filters allowed for optimal narrowing of the search. The research strategy used combinations of the keywords "Artificial Intelligence" or "AI" and "human resources" or "HR" or "HRM" together with at least one of the keywords: "bias", "risks", "concerns", "ethics", and "discrimination". Reports had to meet the following three criteria to be included in the review:

- Publication in English,
- Publication date: 2020–2024,
- Articles reporting the impact of AI on human resource management (HRM).

The search conducted on January 2, 2024, returned 3,440 results. Narrowing the search to articles reduced the number to 2591 articles, and specifying the discipline as "Management" and "Business" yielded 37 results. Limiting by language and publication date ultimately identified 32 articles, of which 16 were included in the study after abstract review. Reasons for exclusion included a lack of information on the impacts of AI on HRM. The procedure strategy is summarised in Table 1.

Table 1. Literature search strategy

1. Keywords search
Source: Web of Science Keywords: ("Artificial Intelligence" OR "AI") AND ("Human resources" OR "HR" OR "HRM) AND ("bias" OR "risks" OR "concerns" OR "ethics" OR "discrimination") **(N=3440)**
2. The first level of inclusion criteria:
• Publication year: All years until 2020 • Document type: Article • Language: English **(N=32)**
3. The second level of inclusion criteria – Abstract analysis:
Subjects AI impact on HRM **(N=16)**
4. Final sample
N=16

Source: own study.

Given the adopted method focused on manual content analysis, relevant information was extracted from the literature, and the coding results were meticulously recorded in an Excel file. This approach aimed to minimise errors and document the coding processes to facilitate replication and ensure transparency (Tranfield, Denyer, Smart, 2003). The essential content to be derived from each article was clearly defined through this process. The systematic coding of the literature enabled the author to gain a foundational understanding of the field, thereby facilitating engagement in iscussions and offering suggestions for future research.

Algorithmic discrimination and other risks of AI

The concept of algorithmic discrimination appears in the studied sources in two contexts. The first has an organisational dimension and concerns potential threats to the organisation's functioning and its relations with stakeholders, and the second is directly related to individual concerns of employees. As Bartosiak and Modliński indicate, malfunctioning algorithms supporting personnel decision-making can affect managers' judgments, resulting in harsher and less reflective decisions even if they could harm co-workers (2022). Algorithmic discrimination may draw from previous improper practices of recruiters, which can result in their replication in the recruitment decision-making process (Olajide, Sposato, 2022; Soleimani, Intezari, Pauleen, 2022). MalikTripathi, Kar, and Gupta (2022) highlight this: "We need to make sure that decision-making in our algorithm doesn't replicate some of the bias that we have already in our society". Faulty algorithms can deter valuable job candidates (Mirowska, Mesnet, 2022) or favour specific social groups. Attention should be paid to algorithms for monitoring employee performance, which can negatively impact their mental health. Similarly, in compensation and benefits, there are cases where implemented systems based on algorithms contribute to wage inequality in the workplace with all its consequences.

In the context of individual employee concerns regarding their sense of security and work, algorithmic discrimination primarily appears as a potential cause for them making faulty decisions (Malik, Tripathi, Kar, Gupta, 2022), bearing personal responsibility, negative work evaluations, or the lack of an opportunity to explain the decisions taken. Concerns are raised that comprehensive work analysis supported by AI can be biased, potentially becoming a source of discrimination, inequality, and lack of trust among employees.

The literature identifies several direct sources of "algorithmic errors," including improperly prepared data, data reflecting improper human behaviour, flawed algorithms, and the lack of appropriate technology. Alongside the issue of algorithmic discrimination, the literature also points to a range of other threats. Attention should be drawn to ethical and legal issues, information security, or, on an individual level, technostress, which directly affects the emergence of algorithm aversion.

Analysis of selected texts indicated that the most frequently addressed issue in the context of smart technologies in organisations is the barriers encountered during their implementation. Issues often arise concerning inadequate competencies among employees and a lack of vision and strategy related to AI implementation, data access, and organisational support. Primarily, the significant role of analytical and HR competencies (Conte, Siano, 2023; Oswald, Behrend, Putka, Sinar, 2020),

as well as the lack of sufficient collaboration and exchange of experiences between HR specialists and AI solution developers (Soleimani, Intezari, Pauleen, 2022), is highlighted. The important role of entrepreneurship is also noted, in which possibilities for utilising AI potential and countering its limitations are seen (Baldegger, Caon, Sadiku, 2020).

In the SHRM context, the lack of a long-term vision for implementing AI, in terms of human-machine relations and clearly defined goals and expected organisational outcomes, seems to be a significant issue. Short-sightedness (Conte, Siano, 2023), unrealistic optimism (Weber, 2023), and excessive trust in technology (Bartosiak, Modliński, 2022) are prevalent. From the HRM perspective, the lack of an idea for collaboration between humans and machines (Ivaschenko, Diyazitdinova, Nikiforova, 2021), HR immaturity manifesting, among others, in a lack of an idea for work organisation (Arias, Rivero, Márquez, 2023), and resulting in communication problems and, for example, the absence of job descriptions adapted to conditions of cooperation with machines (Suseno, Chang, Hudik, Fang, 2022) are pointed out. The absence of defined agreements and "rules of the game" is one of the elements affecting employee attitudes in the AI adaptation process, resulting in technostress (Malik et al., 2022).

Interestingly, despite identifying many barriers, researchers minimise the organisational risk resulting from AI implementation, focusing primarily on the potential benefits of deploying this technology. Benefits such as increased efficiency (Kshetri, 2021; Olajide, Sposato, 2022; Oswald et al., 2020; Weber, 2023), enhanced competition capabilities (Soleimani, Intezari, Pauleen, 2022; Weber, 2023), reduced human errors (Kshetri, 2021; Trocin, Hovland, Mikalef, Dremel, 2021), more detailed analytics and unprecedented data analysis capabilities (Oswald et al., 2020), improved knowledge management (Baldegger, Caon, Sadiku, 2020), professionalisation (Trocin et al., 2021), and time savings, which allow a focus on strategic initiatives (Malik et al., 2022), are emphasised. At the same time, only potential losses resulting from algorithmic errors (Olajide, Sposato, 2022; Soleimani, Intezari, Pauleen, 2022) and unfavourable evaluations of the company by selected stakeholder groups (Malin, Kupfer, Fleiss, Kubicek, Thalmann, 2023; Mirowska, Mesnet, 2022) are seen in the sphere of threats.

The individual reception of AI technology by employees is usually negative, focusing mainly on concerns related to job retention (Malin et al., 2023; Olajide, Sposato, 2022), uncertainty, and fear of role degradation in the organisation (Malik et al., 2022). The effect of technostress, amplified by the speed and efficiency of smart technologies, further deepens this negative perception. Employees may perceive AI-based HR systems as a control tool, leading to decreased internal motivation, job satisfaction, weakening of responsibility and learning abilities (Weber, 2023).

Despite identifying numerous barriers, the literature also highlights the positive impact of AI on people, defining precisely opposite assertions. The varied and opposing assessment of AI technology, especially on an individual level, with the simultaneous absence of symmetry between organisational threats and benefits, leads to particular attention being paid to the HRM area. The mentioned organisational limitations, such as short-sightedness, lack of managerial support, unpreparedness for absorbing new technologies, and emphasis on economic aspects, undoubtedly strengthen employee concerns. On the other hand, communication, transparency of information, awareness of risks, and attempts to establish rules of cooperation between machines and humans can unleash the positive potential of this technology and its impact on employees.

The role of SHRM in the AI implementation process in an organisation

AI technology brings enormous potential, requiring a change in the current understanding and execution of work. A lack of knowledge about AI and how it functions, the use of data and its unprecedented acquisition levels, as well as changes in decision-making processes, naturally raise stakeholders' concerns. The social aspect seems to have key importance here.

Based on the conducted literature review, it is not possible to unequivocally assess positively or negatively, the potential effects of AI technology applications and their usefulness for organisations. The topic is complex and multidimensional, meaning the opportunities or threats can be interpreted in various ways. An example illustrating this ambiguity is the concept of algorithmic discrimination. One of its sources is the improper behaviour pattern adopted by the algorithm (Kshetri, 2021), which are based on human practice. It is difficult to agree with the thesis that improper human practices replicated by machines are the fault of the implemented technology. A trained algorithm that correctly reflects the patterns of action indicated to it operates properly. In this case, algorithmic discrimination is a continuation of existing company practices, and its sources lie not on the side of technological shortcomings but in the maturity level of the organisation and its managers. Another example is individual algorithm aversion (Hofeditz, Clausen, Riess, Mirbabaie, Stieglitz, 2022), which is caused by fear for the future of one's work, career, or role in the organisation. It is difficult to discuss uncertainty directly derived from a parameterised technological solution. Uncertainty finds its source in insufficient information, which results from a lack of information flow due

to inadequate communication management, or, more broadly, from the immaturity of the organisation and its managers.

The examined literature indicates numerous positive or negative issues associated with AI implementation. Interestingly, some of these issues are mutually exclusive. Opportunities include increased work efficiency (Kshetri, 2021; Olajide, Sposato, 2022), development of competencies (Trocin et al., 2021), independence of work from place and time, increased employee autonomy (Malik et al., 2022), and consequently the potential for balancing professional and private life. On the other hand, risks associated with technostress are highlighted, such as extreme work exhaustion, fatigue, interference in the private life of the employee (Zhou, Wang, Chen, 2023), depreciation of competencies, loss of role in the organisation (Malik et al., 2022). These examples are countless. These examples are countless. Therefore, implementing the same AI technology in different organisations may have bad or positive consequences for employees and the entire organisation. What determines this outcome? What factors influence the final assessment of the effects of such implementations? To answer research questions No. 1 and 2:

1. What determines the negative or positive perception of AI in an organisation?
2. What is the role of SHRM in the AI technology adoption process?

Paying attention to the social aspect and its value for the organisation is essential. Organisational requirements (AI strategy, employee qualifications) are intertwined with ethical issues, including privacy (Vrontis, Christofi, Pereira, Tarba, Makrides, Trichina, 2022). In sustainable management – whether Socially Responsible HRM, Green HRM, or Triple Bottom Line HRM – social-environmental aspects are considered important as long as they support economic goals and are somewhat subordinate to them (Dyllick, Muff, 2016). The Common Good HRM approach tackles "grand challenges" by using HRM competencies, skills, knowledge, and attitudes to contribute to the common good. An analysis of available literature suggests that many organisations continue to prioritise economic values, treating social issues as secondary. As the literature confirms, organisational factors are significant barriers to AI implementations and sources of its adverse effects. As Mirowska and Mesnet indicate, one such factor is the lack of open communication. In recruitment processes, for example, candidates want fair treatment and should be informed about the use of AI technologies early in the process. The lack of such knowledge creates uncertainty and diminishes control over the process (Mirowska, Mesnet, 2022). This is also related to the problem of trust, which is an important factor in establishing relationships. As Arias et al. indicate, in situations of choice, employees prefer interacting with the partner they trust, whether it is another human or a machine (Arias, Rivero, Márquez, 2023). Communication and trust are characteristics of HR maturity and strategic awareness. The lack of a long-term vision and a focus on short-term

goals are perceived as significant barriers to technological advancement within an organisation (Conte, Siano, 2023), as well as adopting of a data-driven management culture (Oswald et al., 2020). A perfect practical example of how these factors affect the perception of technological change is indicated by Suseno (2022), citing cases where a lack of clearly formulated job descriptions failed to account for changes AI implementation would bring to organisation. This indicates a lack of a developed vision for the organisation, which, naturally leads to employee uncertainty and concerns. This is probably also related to too far-reaching faith placed in the possibilities of new technology and unjustified optimism (Weber, 2023). In conclusion, the key determinant of whether technological change is viewed positively or negatively is not the technology itself, but the organisation's maturity,expressed a clear vision based on trust and open communication. The preparation for implementation process itself, ensuring the necessary competencies, knowledge, and principles of the future human-machine relationships, is also significant. The role of SHRM seems crucial because it reconciles social needs and concerns with the economic needs and goals of the company (Dyllick, Muff, 2016).

Conclusion

Standing on the threshold of a technological revolution driven by the dynamic development of artificial intelligence, we must reflect deeply on the values that guide contemporary organisations. The economic potential offered by AI may seem tempting, but it raises questions about the sustainability and realisation of the concept of sustainable development. The literature analysis reveals that the impact of AI on the labour market and human resource management is not unequivocal. Threats such as mass layoffs, which began materialising in 2023 and 2024, indicate that the concept of sustainable people management remains theoretical for some organisations. Nevertheless, examples from the literature highlight Sustainable Human Resource Management as a key element in adapting to technological changes. Organisations guided by values beyond purely economic calculations demonstrate the ability to overcome barriers associated with implementing AI, maximise the benefits of new technologies, and strengthen their competitive position. In the context of work revolution carried by AI, sustainable people management requires not only accepting inevitable changes but also supporting employees through these changes and investing in developing their future competencies.

Investing in human potential, though it may not bring immediate profits, is an investment in long-term value for both the organisation and society. Providing employees with tools for adaptation and development in a changing technological

environment protects their value in the labour market and helps build sustainable, resilient, and innovative organisations ready for future challenges.

Given the growing role of AI in economic life, a sustainable approach becomes crucial. It involves harmonising the pursuit of innovation and efficiency with commitment to employee well-being and long-term social goals. The future of work in the AI era will depend on the ability of organisations to combine technological progress with deeply rooted social responsibility.

Limitations and future research

Research into the implementation of AI technology encounters significant limitations, primarily due to the novelty of the topic and the limited availability of comprehensive sources. This analysis is based on a relatively narrow spectrum of available publications, which can affect the completeness and universality of the conclusions drawn. Furthermore, the area of AI technology deployment and implementation is characterised by considerable diversity in terms of available technologies and their varying practical applications. This heterogeneity complicates comparisons between cases and the generalisation of results. Also, discrepancies in AI definitions and the topic's multidisciplinary nature introduce challenges in clearly defining research scope. The literature often relies on the subjective opinions and assessments of managers and employees, which can introduce bias into the analysis.

The identified limitations highlight a wide field for further research. The multidisciplinary character and broad thematic scope of AI-related issues underscore the need for an interdisciplinary approach in future research. These directions may include:

1. Analysis of the Effects of AI Deployments: Investigating how organisations can effectively utilise resources released due to AI deployments and understanding the changes in the competency structures due to evolving human-machine relations.
2. Assessment of the Impact of AI on the Value of Products and Services: Exploring how customers' perception of product and service value change with the influence of AI applications and identifying new valuation strategies enterprises can adopt.
3. The Impact of AI on the Labor Market: Examining how AI implementation affects the needs and expectations of employees, especially in the context of changing competency requirements and professional adaptation.
4. Development of Research Methodologies: Developing new methods and research tools that facilitate in-depth analysis of the complex dependencies and effects of AI implementation, considering its multidisciplinary nature.

Future research should also aim to expand the source base, including empirical data and case studies, to better understand the realities of AI implementation and its long-term effects on organisations and society.

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