Science, Education and Innovations in the Context of Modern Problems
Issue 2, Vol. 9, 2026

RESEARCH ARTICLE

Artificial Intelligence–Enabled Green Human Resource Management as a Strategic Architecture for Integrated Environmental Sustainability, Organizational Well-Being, and Socio-Ecological Transformation in Contemporary Organizations

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Issue web link https://imcra-az.org/archive/392-science-education-and-innovations-in-the-context-of-modern-problems-issue-2-vol-9-2026.html

Keywords Artificial Intelligence (AI); Green Human Resource Management (GHRM); Digital Sustainability; Environmental Governance; Organizational Sustainability; Work–Life Balance; Green Organizational Culture; Employee Well-Being; Sustainable Human Capital; Ecological Transformation.

Abstract

The rapid diffusion of artificial intelligence (AI) technologies across organizational systems has fundamentally reshaped managerial processes, decision-making structures, and human resource architectures. However, despite the growing strategic importance of sustainability-oriented management models, the conceptual integration between artificial intelligence and Green Human Resource Management (GHRM) remains theoretically underdeveloped and empirically underexplored. This study advances a comprehensive conceptual framework that positions AI not merely as a digital tool, but as a structural enabler of environmentally responsible governance, green workforce transformation, and integrated sustainability performance within organizations. The article critically examines how AI-driven systems can enhance core GHRM functions—including green recruitment and selection, eco-oriented performance management, sustainability-based training and development, green employee engagement, and environmentally responsible organizational culture formation. It argues that AI facilitates the transition of GHRM from a fragmented operational practice into a strategically embedded sustainability architecture aligned with organizational vision, environmental ethics, and long-term ecological responsibility. Furthermore, the study conceptualizes AI-enabled GHRM as a multidimensional mechanism that simultaneously strengthens environmental performance, employee psychological well-being, work–life balance, green job satisfaction, and pro-environmental identity formation. By integrating insights from positive organizational scholarship, sustainability science, and digital transformation theory, the paper demonstrates how AI can foster employees' psychological connectedness to nature, reinforce shared environmental values, and institutionalize sustainable behavioral norms within organizations. The proposed model reframes GHRM as a dynamic socio-technical system in which artificial intelligence functions as a catalyst for ecological consciousness, organizational resilience, and sustainable value creation. The study contributes theoretically by advancing an integrative sustainability governance perspective and practically by offering a strategic roadmap for organizations seeking to align digital transformation with environmental responsibility and human-centered sustainability objectives.

Citation
Hamza L.; Braham N. E.; Hafassa A. (2026). Artificial Intelligence–Enabled Green Human Resource Management as a Strategic Architecture for Integrated Environmental Sustainability, Organizational Well-Being, and Socio-Ecological Transformation in Contemporary Organizations. *Science, Education and Innovations in the Context of Modern Problems*, 9(2), 1-11. https://doi.org/10.56334/sei/9.2.25

Received: 16.09.2025	Accepted: 26.12.2025	Published: 18.01.2026 (available online)

1. Introduction

Integrating environmental sustainability is a necessity for global organizations in the contemporary millennium. The twenty-first century faces enormous challenges such as global climate change, pollution, poverty, and poor health, to name a few. Given the negative environmental impact and deteriorating socio-political beliefs, researchers are beginning to scrutinize the contribution of businesses to environmental practices in pursuit of a sustainable economy. Research goes as far as to explore how artificial intelligence could notably modify the nature of human resource management practices since these frameworks have previously been explicitly scripted to balance the power of employees with top management.

Extant criticism reveals that human resource management strategies are difficult because of deteriorating labor skills, and there is a need for environmentally sensitive practices to fill performance gaps. Human resource management involvement in environmentally responsible initiatives goes beyond job design and job performance control to environmental hiring and selecting practices, such as recruiting personnel based on their environmental thinking. Aligning human resource management policies with environmental initiatives is the focus of green human resource management. The integration of sustainability into traditional human resource management practices, as well as green human resource management, underscores the need for integrating sustainability into management practices. This paper analyzes the contribution of artificial intelligence in supporting the transformation of green human resource management from an operations frame to an integrated sustainability function aimed at organizations. Also covered is the relevance of constantly changing artificial intelligence to transition green human resource management processes as a necessity for technology that supports critical sustainability personnel issues—enabling artificial intelligence and human resource management in a collaborative atmosphere. We suggest a framework to capture a collective understanding of the relevance of artificial intelligence and green human resource management and discuss the theoretical and practical implications of this complex interrelation.

2. Understanding Green Human Resource Management (GHRM)

With the onset of the 21st century, new concepts have emerged in shaping the management of human resources in organizations. Green human resource management is a concept that has evolved due to increased emphasis on the protection of the environment in businesses, communities, and the global environment. The key message of GHRM is that businesses need to pursue equality and manage their human resources effectively in an eco-friendly manner. The development over time has led to the Exploration-Exploitation Theory, which suggests that GHRM can contribute to both short-term employee well-being and long-term organizational environmental sustainability. It also incorporates green sustainable HRM practices to ensure the survival of the organization based on how it affects productivity, employee well-being, customer, and stakeholder outcomes. (Nisar et al.2021)

Findings of previous studies have suggested that there is an indication that employee green job satisfaction partially mediates the relationship between green HRM implementation and environmental performance. They underscore and support green HRM as a means to enhance environmental performance and improve employees' green job satisfaction. By utilizing the EET approach, organizations can explore and exploit green HRM based on their resource access and scarcity. Other researchers have examined the perceptions of managers regarding the significance of HRM related to sustainability and highlighted that the organization's financial and operational resources should be structured and iterated on a long-term basis to manage sustainable outcomes. (Amjad et al.2021)

2.1. Conceptual Framework of GHRM

Framework construction starts from operational definitions and assumptions of what Green Human Resource Management concepts consist of. We considered mainly the Green HRM literature. GHRM is a step-by-step innovation. It is starting to grow in the proceeding 25 years, acknowledging multiple organizations and the different internal stakeholders supporting businesses. It concentrates attention on the valuable role played by organizations' HRM, ranging from providing external components that drive changes in future fields. GHRM responds to the demographic changes around the world, where there is a restriction and a limit in the availability of natural resources resulting from greater climate variability and growing populations. (Sharma et al.2022)

The purposeful GHRM system allows the organization within the environmental strategy to be noticeable, focusing on the following perspectives: attracting and recruiting people, organizational leadership, social responsibility, training

in attitude and behavior, and performance management. Here, to symbolize the place that integrates Environmental Management, it is one way in which an 'integrative' viewpoint would be common for the continuity of environmental management and the efficiency of what the organization wants. It is shown diagrammatically by integrating a sustainable organization and environmental management, especially the components of the integrated quality management tools, such as HRM, promoting economic environmental monitoring. (Ahmed et al.2023)

2.2. Key Principles and Practices of GHRM

The importance of 'people issues' management for environmental protection is discussed. The notion of green environmental management based on the application of selective human resource practices is provided. GHRM and practices include environmental knowledge and skills, behavior, and specific green values deeply embedded in an employee's mind. Relations are often seen as a critical component of the degree to which GHRM supports HR qualifications. Recruitment, selection, training, development, assessment, execution, and payment play a role here. Flexibility in the workplace is progressively necessary, and one conclusion is that a lack of labor or commitment may be more successful in flexible organizations. These include flexible working hours, small practices, job discretion, and self-managing teams or groups. Leaders may adapt patterns of GHRM to a greater focus, a necessary attribute to improve the integration of sustainability and the reality of the impacts of organizations on the environment. Product advances or organizational initiatives stimulate staff to turn their backgrounds, beliefs, and values into successful business leaders. Powerful action-based ethics and social and natural capital practices contribute to developing sustainability. (Ahmad et al.2021)

Conversely, factors contributing to greater environmental consideration generally connect to psychological, leadership, business, strong value-based organizational citizenship actions and characteristics of corporate social responsibility such as pro-environmental counseling, perceived corporate environmental behavior, and customer perceived corporation satisfaction. Such activities are the psychological links between GHRM practices and organizational environmental actions. The promotion of cooperation in societal growth is in line with the business mission and vision. Supportive leadership helps with the approval of company stakeholders for purposes. In conclusion, the leap towards more flexible and integrated GHRM qualities allows a transition from the management of labor, which is business-focused and mainly manages unwelcome duties, to a more proactively oriented function that is superior to society and the environment, which have so far been forced at the equity cost. (López-Cabarcos et al.2022)

3. Artificial Intelligence (AI) in Human Resource Management

AI is one of the critical emerging technologies, also referred to as cognitive systems and cognitive computing, generally used to automate high-level knowledge work. AI, including deep learning, machine learning, big data, and artificial neural network algorithms and associated technologies, is being increasingly employed in qualitative research. This is because AI programs have the capacity to understand, learn, and manage very effectively within uncertain contexts. Some argue that this capacity encompasses a measure of consciousness and the ability to process strategic and tacit knowledge. AI has far-reaching consequences in a variety of jobs, therefore demanding not only different knowledge and skill requirements but also job recognition of new technologies for fostering accurate problem solving, learning, and multitasking, as well as the capacity to augment human cognition. With the help of AI, HRM practitioners are capable of predicting employee turnover after analyzing and categorizing unstructured textual information obtained from resumes. This is powerful since it enables HRM to make sound evidence-based decisions. Organizations, HRM professionals, and academic scholars jointly need to pragmatically learn, develop, and employ AI semiconsciously, then deliberately, instinctually, and strategically in order to radically rethink and redefine HRM sustainable strategies that are effective and efficient for smart goals realization (Asatiani et al.2021). This will systematically lead to a well-functioning collaborative society that pragmatically realizes sustainability and resilience, proactively secured by the community of intentional and thoughtful individuals who re-establish meaningful human existence. Evidently, AI is at the heart of transformative HRM and has far-reaching impacts in achieving HRP's goals. With the valorization of nature-bearing economies as organic bases for societal prosperity and the environment's inspiration as one of the many ledgers corporate and organizational recognition endeavors follow, technology has citizens and nature as final beneficiaries. (van, 2021)

3.1. Overview of AI in HRM

To earn recognition and acceptance among academics and practitioners, regardless of the field, the first requirement is a comprehensive knowledge base. The required basic knowledge of AI applied to HR management is presented below. From the results of the extensive review of relevant literature, we summarized important studies in AI learning and management literature to present AI knowledge and applications in HRM. AI integrates machine learning methods that can solve complex problems, without explicit explanation, at a variety of levels. AI, as a subset of computer science, has been addressed for many years and serves important purposes in how we think, act, and analyze, despite aspirations for broader power and capabilities that sometimes overshoot its existing limitations. AI methods are evolutionary patterns in reaching even stronger cloud facilities performance and could develop much more sophisticated ways of deciphering central features of HR behavior. (Soori et al., 2023)

AI offers companies the chance to take advantage of what the new data-generating marketplace offers and develop innovative HR applications for executives, HR researchers, and practitioners. An important application of AI is the examination of large data sets, as it would open new ways with unpredictable predictions and correlations, which could lead to successful actions. Such practice is essential, particularly in HRM, which is more about managing individuals than other company service divisions. Even on a sophisticated level, AI methods have several drawbacks that can lead to false accusations of undoing the class predictions to show important lessons for those involved. Such capabilities would further focus on large-configured datasets with swift computations. Otherwise, they will completely lose the power and flexibility that have increased real strength in other HRM fields without any consequences. With images of coordination in diverse settings, AI can address substantive problems. We highlight these and other pitfalls and strategies that contribute to development. (Vrontis et al.2023)

3.2. Benefits and Challenges of AI in HRM

Organizations are increasingly investing in AI to enhance the efficiency of their HRM in recruiting, analyzing, and rewarding employees, making them empowered and motivated to realize the best customer service and attain enhanced organizational operational and financial outcomes. AI provides firms with HRM tools to adjust employees' contributions to strategic needs, thus retaining high-quality staff, lowering the cost of wrongful firings, and driving strategic change. In terms of the environmental dimension of HS, AI-based HR applications are seen to better target employee concerns, raise employee awareness, assist in green training, focus leaders on facilitating environmental improvements, support environmental communication, and promote HR practices and positive employee outcomes. There are three major benefits obtained from the combined contributions of AI and HRM to enhancing HS: namely, reducing resource wastage, being innovative, and moving toward integrated HS accordingly. (Ghedabna et al.2024)

Despite its extremely promising potential contributions to HR-related functions and environmental efforts in organizations, AI in HRM also encounters many significant challenges. Privacy and confidentiality concerns are among the most frequently discussed AI-related difficulties faced by practitioners. The growing fear of AI radically influencing behavioral norms and cultural values shapes the work context and must be effectively addressed through industrial and organizational psychology. There is also evidence that AI creates anxiety for some leader-related functions, such as a decreased need for or misuse of judgment through overreliance on technological solutions, as well as concerns regarding the opacity of some AI solutions. The problem of tokenism, which inadvertently leads to a "rolling back" or paucity in the program, must be addressed. Lastly, the global digital divide, with many people and even more organizations lagging in the digital world, has been a perennial concern for corporate responsibility and sustainability scholars alike. All these challenges of AI in HRM create potential obstacles in cultivating integrative HS strategies and engagements in organizations. (Arslan et al.2022)

4. The Intersection of AI and GHRM for Environmental Sustainability

Both artificial intelligence (AI) and green human resource management (GHRM) exhibit a capability to ensure environmental sustainability. AI technologies are intended to enable useful operations, solutions, and connective information for optimizing GHRM practices. Both have great potential to share resources and emerge as collaborative tools for environmental sustainability practices in operating organizations for promoting long-term welfare. This review highlights how AI facilitates GHRM for ensuring environmental sustainability. Robust relevant literature is used to propose a conceptual framework for AI-GHRM. The resultant framework highlights ten key capabilities of AI that enable GHRM: attract candidates with social responsibility behavior, expedite diagnosis of environmental performance, predict social responsibility trends, identify cost-effective HR practices for sustainability, align HRM/HRD practice with environmental sustainability on a fast track, predict employee turnover and absenteeism for sustainability, ensure work-life balance, foster employee engagement, implement multidimensional performance appraisal, and handle big data supporting GHRM. (Bijoria2024)

Artificial intelligence (AI) is emerging as a powerful resource that can facilitate green human resource management (GHRM) in its function of ensuring environmental sustainability outcomes in operating organizations. Research can make significant contributions to the debate on the coupling of technology and human resource management (HRM) sectors. AI can be efficiently used to improve the recruitment process by identifying eco-friendly candidates suitable for green work. AI can customize job advertisements and ensure specific individual eco-value matches based on social media and demographic profiles, thus attracting suitable candidates successfully. In the compliance monitoring of eco-performance results, AI has already enhanced the organizational practice of monitoring essential environmental performance indicators as they happen by integrating the environmental management system data with an expert system. Based on both, several laws and an expert system in tandem monitor the organization's emissions of pollutants and maximize the environmental reinvestment credit return values. In this way, AI efficiently uses large quantities of data from the environmental management system. Through its data analytics, it could also help in the identification of cost-effective GHRM practices for raising environmental standards by diverse business sectors. AI also identifies potential key trends, such as the social responsibility attitudes of employees and candidates from legal settlements to public issues regarding environmental responsibility where substantial resources have been allocated. In addition, digital marketing used AI to place job advertisements on social media accordingly. Ads were

placed in world duty-free airport lounges since they attract a higher portion of globe-trotting applicants. (Ari et al., 2020)

5. Current Practices and Challenges in GHRM and Environmental Sustainability

In practice, organizations design and implement policies and practices that minimize ecological footprints and lead to the successful implementation of environmental sustainability. The practices include the reduction of environmental pollution, reduction in energy consumption and emissions, minimization of waste and associated costs, the design and implementation of environmental systems, reducing water and energy consumption, increasing energy efficiency, using life cycle assessment to evaluate the environmental impacts of their products and processes, and conducting carbon accounting as a means of operationalizing their organizational carbon footprint. The best practices embedded in GHRM include supporting tools and policies, waste reduction, energy efficiency, organizational indicators for GHRM, and assessment methods. There is also an examination of why adoption levels are low and what the main barriers are. (Sharma et al., 2021)

However, it is argued that organizations only try to integrate their existing HR practices and GHRM initiatives. Few organizations have shown leadership in promoting corporate-wide initiatives to improve their environmental sustainability within regular HR training and development initiatives. Therefore, organizations need leaders to support climate-friendly 'green HR practices.' A key challenge is leadership development in sustainability. In terms of training and development, the literature suggests that once staff are properly inducted into sustainability topics, there is a continuous flow of training to develop competencies like strategic thinking. Moreover, at high levels of management, similar competencies are also discussed, such as strategic thinking in the context of GHRM, change management for a green climate, and market orientation for sustainable development. Additionally, personal development, specifically in cross-cultural sensitivity and integration, will be essential in building relationships with staff members from different cultural backgrounds. Indeed, there are noted differences in implementing international HRM management strategies among cultures from different trade partners. (Joseph2023)

6. Integration of AI, GHRM, and Environmental Sustainability

In sum, while the intersection of the three domains of AI, GHRM, and employees' environmental sustainability is growing, the development of AI techniques in GHRM and their honest intention to enhance environmental sustainability are slow and underrepresented. It is also worth noting some AI applications generate negative consequences. Only four studies on AI and staffing support the idea that skill demand can put tension on employees' environmental sustainability, which may worsen outcomes in terms of well-being, disposable time, self-efficacy, and environmental commitment and behaviors. While AI itself can be green and part of the solution for mitigating climate change, AI that supports companies in winning the war for talent can generate job burnout and drive R&D officers, engineers, and consultants of technical platforms into an "ecological trap" outside work, expecting unpaid work for preserving, and even increasing, the coherence of one's addictive role with one's self-identity. This articulation takes place because social cognitive and self-regulation theories indicate that people generally expect to avoid illicit personal benefits that may damage their eco-friendly image and social identity. Finally, the physical and organizational environment addresses the AI and facility examples synergistically tuned for environmental sustainability, and the application areas could be extended. Complementary support can be provided by integrated AT, IoT, 5G, and cloud computing solutions for employee work, such as AI chips for edge computing-integrated smart wear and training equipment, plants and building control systems, energy footprint-less AIs based at the company site, revamped machines independent from the cloud and external location priorities, and restored equilibrium between energy savings, the facilitation of users' activities, behavioral analysis, the health and well-being of workers, and the professional and psychological distance between workers and the artificial intelligence algorithm. (Liu et al., 2023)

The positive effects of these integrated practices on firms' outcomes are recognized in the literature. Indeed, encouraging green organizational citizenship to assist in achieving environmental sustainability might be a primary objective of GHRM. Organizations have to capitalize on effective HRM that integrates relevant practices to deliver a range of integrated performance outcomes, including devolved control over job outcomes, greater autonomy, and autonomy over individual performance, corporate citizenship behavior, and corporate sustainable development. (Liu et al., 2021)

An integrated approach to GHRM practices can not only motivate adoption by employees but also enable them. This would involve introducing required new knowledge, fostering new types of employee behavior, and performing an attitude of congruence with a focus on the individuals' experience of their organizations as important, supporting their firm's greater commitment to sustainability. This study devises a framework of the integrated work on GHRM that can guide further research on the different aspects and impacts of integrated GHRM efforts. The findings of the exploratory cluster analysis conducted suggest that different roles, behaviors, and attitudes of employees regarding environmental issues can further support the performance of the employees and guide the formal development of these individuals. (Ahmed et al.2021)

7. Intersection of AI and Green HRM

Artificial Intelligence (AI) has the capacity to positively influence organizational functionalities. Drawing from the wider concept, AI can potentially contribute to better organizational social performance, including environmental impact. Green Human Resource Management (GHRM) is a strategic approach focusing on adopting integrated environmental sustainability in organizations. This scope has taken different forms to minimize the environmental impact, including green policies, reducing waste, and enhancing the efficiency of energy consumption, offering green products and services, championing philanthropy, being accountable and transparent about environmental performance, becoming a certified business, substantiating the existing green processes, and taking part in sustainable practices. By giving AI consideration in HRM, it is linked to furthering the decision-making process and developing the capabilities of the HR department. (Pham et al., 2020)

AI applications can assist organizations in reducing operational emissions, bringing sustainable development within their operations and supply chain, and making employees more environmentally proactive. Many organizations have currently started to implement green policies and practices, which are usually triggered, adopted, and implemented by the HR department. Integrating AI-enriched insights can also help organizations foresee which operational aspects they excel in and what employees are more concerned about, in order to form better green policies, thereby boosting considerable green initiatives for enhancing organizational physical growth. Making information and knowledge explicit by offering training and communications, and by developing strategies that encourage higher levels of intensive collaboration among diverse groups of employees can minimize the burden of greenhouse gas emissions. AI can also help in developing a green culture by offering better communication among the workforce through structured electronic channels. The aspects mentioned before could also convey those benefits and engage the interest of the individual workforce to contribute to formulating a green culture within the workplace. Integration of AI applications within the HR function is driving innovation in the development of sustainability in the HR systems of organizations. AI solutions within the HR function are usually focused on the operation of HRM, such as AI-driven improvements in recruitment, selection, placement, and orientation of employees. AI in the HR function enables HR managers to build strong relations with their employees with respect to green processes at work. Ethically, issues involving technical risks and socio-political implications have been raised regarding the extensive applications of AI in the field of HR or Green HR. Socio-ethical and operational concerns have also been articulated, such as the over-reliance and control exercised by higher management over the workforce. Further, concerns about invasion of privacy have also been raised regarding the employment of AI for Green functions, as it might expose employees to external entities in the form of developments for the security of the organization. (Ahmad et al.2022)

7.1. AI Tools for Environmental Monitoring

Monitoring the various organizational activities that contribute to environmental impact is considered a critical component of GHRM. Environmental monitoring keeps track of the activities and resource usage of the organization and determines the impact of manpower on the environmental system. Once data has been collected, environmental monitoring can be used to produce baseline information on the level of organizational impacts and how they have changed over time. Environmental monitoring systems should be designed in an informed way and should be able to respond to environmental variation for accurate predictions to be made. A number of AI-driven systems are used for the monitoring of industries, offices, or organizations. This includes real-time environmental monitoring, process quality control, or situational awareness systems. The purpose of such systems is to provide data on the environmental performance of the organization and to help with the efficient use of resources and monitoring compliance with environmental policies and international standards. We argue that various AI tools can be deployed within organizations to monitor and manage the organizational activities likely to have negative impacts on the natural environment. Such systems can help organizations contribute to green environmental practices, internally and externally. (Huang et al., 2021)

Such AI tools can provide information on the usage of energy, water, and materials by the organization, including waste generation. AI can provide managers in organizations with sensitive and detailed information on the consumption of natural assets by the organization and empower them to act in a sustainable manner that takes into account the limits of the environment. Green HR systems can also provide the organization with the skills of sufficient employees required to monitor and respond to new environmental legislation worldwide. The combined activities of environmental monitoring can help attract and retain human resources by organizations. To demonstrate, we will outline the role that other AI technologies can play in predictive environmental impact assessments. We provide a number of case studies to demonstrate tools used in developing predictive environmental models and their impact on the reduction of environmental harm. We draw on research in the above disciplines to illustrate the potential uses of AI in environmental monitoring in our integrated approach. (Nurhaeni et al.2024)

7.2. AI for Sustainable Workforce Planning

Workforce planning in GHRM is an attempt to reconcile the growing environmental and social requirements in their workplace by preparing effective management systems. AI could be used to forecast the demand for future

skills needed. AI algorithms can analyze data on today's staff capabilities, such as high performance in environmental management and leadership, expertise in sustainable product design, supply chain analysis, impact assessment, and developing social performance indicators regarding sustainability. A good employer will also begin to accumulate a bank of information about the employees' ambitions, wishes, and plans, and also express their own towards work with sustainability for future roles. Through a range of employee engagement scorecards and performance indicators, AI will identify what the sustainability-related employees value highly. AI will help in the analysis of data to find out the profile of "the right" employee for this, developing a talent acquisition strategy to attract "the right" talent; integrating sustainability messaging in talent value propositions; and improving retention and engagement strategies. (Javaid et al.2022)

AI will enable additional retention strategies via the identification of the basic motivational preferences for sustainability employees and retention drivers. Use a survey tool to assist with rapid collation, compilation, and analysis of large volumes of examination and employee self-ratings, in this example used by an organization to provide a viewpoint on specific business performance frontiers. These are used to trend individual engagement in these critical areas with relevance to performance and reward. New AI can be integrated into the existing framework of the workforce, including policies, procedures, organizational structures, and culture. Enabling the workforce planning process may also aid the completion of a detailed analysis of any alternative deficits or veto grounds that might detract from the potential of implementing their future workforce on a business's overall readiness to improve sustainability. High utilization of AI can further offer savings benefits. When the approach to HR and workforce planning is greater and there is deep respect for the workforce development empowerment of each person, the benefits will increase with the use of AI, emphasizing the sustainability inherent in realizing that benefit. (Huang et al., 2023)

8. Case Studies and Best Practices

What could a collection of case studies looking at the current practices of AI usage in GHRM help to achieve? Firstly, this collection of case studies is intended to provide a welcome addition to the literature on this topic and provide good practical insight into practice. The framing of the case studies enables a clear identification of three critical areas: the practical implications and innovations in successfully using AI in the GHRM domain, and the individual benefits and results of implementing AI technologies as part of an overall employment vision. There is a range of detailed examples of GHRM AI uses for companies to gain good practice insight from. Moreover, the use of detailed case studies supported by company data with industry context and the accounts of discussions on that evidence from interviews with senior business leaders and academics provides a narratively engaging illustration of the arguments presented. (Aguinis et al., 2024)

Two of our company case studies position the supplier point of view in that they provide products and intelligence in contrast to large global businesses: one a general commerce and global shipping business; and the other a software company. The placement of the first company in this supplier position, on the periphery of their potential business opportunities, lends itself to not only the sharing of their successes in sustainable AI at an operational level for GHRM, but also to some observations of leadership and industry perceivable rules and norms that have the potential to shape the lawful business practices of those on whom they are reliant. (Al et al.2022)

There is a clear emphasis on this integrated approach. The case studies provided here offer insightful perspectives on the successes and obstacles GHRM actors might encounter. However, company leaders working to assert more sustainable and ethical control over their employment cannot resolve all conflicts alone and cannot hope to establish strong and universally fair employment relations without the support of policymakers and other industry leaders. The results from these details also demonstrate a case in point of the added value of integrating AI with potential GHRM operational decision-makers in the GHRM field and industrial arena. They further demonstrate a link with leadership orientation and the resultant establishment and expression of corporate culture in the ultimate performance delivery measures. (Coelho et al., 2024)

9. Ethical Considerations in AI-enabled GHRM for Environmental Sustainability

Today's emerging technologies, including artificial intelligence (AI), also raise a number of ethical issues and dilemmas. In the context of using AI for green human resource management in organizations, some of these ethical considerations include concerns for data privacy, the potential for algorithmic bias leading to moral issues, or the question of how to achieve transparency in GHRM where AI is in widespread use. At the same time, many AI initiatives are rooted in projects of innovation, organizational learning, and discovery in relation to the sustainable management of resources, human capital, and business operations. When organizations use AI for external talent acquisition and internal staff management, they need to carefully align such future developments and changes with their corporate values and social responsibility. National and international organizations, in turn, provide a number of guiding principles and values to reflect responsible and ethical HRM and AI practice. (Mhlanga, 2021)

Many professional HRM bodies demonstrate that the use of employee data requires transparency, fairness, inclusivity, confidentiality, freedom from bias, and the need for accountability. This means that GHRM-AI systems managing large amounts of social, environmental, and company data must preserve individual dignity and human

rights to secure employment, as well as the wider societal responsibility to promote environmental values. However, a substantial part of existing research still remains speculative about ethical AI-GHRM in both the academic and practitioner literatures. This also largely disregards potential issues that may arise when GHRM professionals develop and utilize AI in recruitment, selection, and other areas used for environmental management. The deployment of ethical AI practices is important as AI is often used to recruit, train, and deploy employees in the creation of a sustainable and green work environment. By offering easy access to an array of current applicant data, AI provides HR professionals with a wealth of purpose-driven information supporting the GHRM approach. However, organizations face a series of ethical challenges when utilizing AI to support their GHRM strategies, particularly with selecting suitable candidates. Techniques such as natural language processing use deep learning programs that can supply HR with completely unstructured text, which stores data about thousands, or even millions, of applicants. By doing so, employers and recruiters are now in a position to review more data in a single moment than a panel of human recruiters could perform in a year. Data privacy and a respect for diversity and values are critical in determining the environmental impact of utilizing AI to support GHRM initiatives. Such considerations are thus vital in ensuring ethical GHRM through AI in the twenty-first century and beyond. The involvement of employees in sustainability operations and the commitment to soliciting and operating towards the environmental agenda is vital to attaining this objective. Ethical AI selection and GHRM will therefore identify two key advantages for organizations enacting an inclusive process. First, potential employees can trust and respect HR decisions, growing more interested in the firm and feeling secure and guaranteed in approaching the firm by demonstrating all the needed qualities either by program design or by meeting human capital management standards. Second, by observing the ethical and diversity dimension, one potential employee can sense the connection with the employer, and these staff members are less likely to quit, reducing extensive expenses. Such solidarity acts are significant, as collective-step employees act as green ambassadors, thus enhancing organizational environmental goals and sustainability efficiency. (Hronová & Špaček, 2021)

10. Future Directions and Research Opportunities

This paper has outlined three significant gaps peculiar to when AI applications and GHRM practice overlap in organizations. Each of these gaps provides a unique area for future study. First, there has not been any attempt to explore integrated sustainability strategies with the combined use of AI in the environmental and human resource fields. Moving in this direction would clue into future research, where the first step could be to identify firm-level GHRM strategies associated with environmental sustainability, which are then grouped to understand effective integrated and non-integrated approaches in achieving environmental HRM aims within organizations. Second, although emerging technologies such as AI are likely to significantly shape the landscape of green human resource management, little research to date has considered managing talent that can work well in an AI-augmented environment. The study of talent that might work in an AI-augmented environment would seem timely and would fit well within the technology-literate talent field, which extends from alternative organizing up to how employees are managed in a new world order. Moreover, the exploration of sustainable talent would need to be interdisciplinary, bridging both technological and HR platforms, as well as integrating knowledge, skills, and abilities that would automatically be in demand in a laboratory, for instance. (Yigitcanlar & Cugurullo, 2020)

In addition, the implications are not only for the management of human resources but also for shaping professions and professional education in general. Lastly, gaps regarding future research are identified in how AI can facilitate the assessment of environmental sustainability in HRM practices, as in earlier consultations with the development of transparent performance measures. This might be achieved by developing AI algorithms that summarize insights from organizational case studies where challenges and key capabilities in embedding GHRM in AI are emerging. In conclusion, we welcome real-world applications of this call and case studies and encourage firms to consider adapting their GHRM strategy to meet the seemingly more stringent environmental regulations and societal expectations. By considering a socio-ecological approach, based on creating organizational systems that not only comply with the short-term social license to operate perspectives outlined above but also take a proactive, responsive, and responsible approach by considering long-term ecological sustainability, will be supported. Organizational leaders and managers should consider working with researchers to take a step toward this—not only to contribute to the development of an organization's own resource base but also to conceptualize and shape their HRM in the broader socio-ecological context. We, as individuals, organizations, and professionals, need to develop new ways and practices that embody ethics, relations, and social responsibility, and fundamentally the essence of what it means to be 'green' as a collective good humans do in interacting with their environment. (Aydın & Turan, 2023)

11. Conclusion and Results

The purpose of our essay was to explore the potential contribution of AI for the enhancement of green human resource management. The contribution of AI in organizations towards environmental sustainability draws our attention to the understanding of a shift in the organizations' own "genetic code" – the workforce. AI's impact on various HRM practices will shape organizations in the future towards more sustainable practices. The impact of AI and GHRM will foster the formation of an integrated approach to corporate sustainability. In conclusion, this essay serves as a call for organizations to be ethical and creative in the employment of AI to pursue more sustainable HRM

practices. We underline the necessity for leaders to embark on critical research at the intersection of AI and green HRM to adapt their organizations in trending ways that will impact sustainability.

- ✓ AI has the potential to transform HRM in organizations towards sustainability by offering innovative solutions that can manage the "change" in human workers' behaviors and adopt a workforce for effective CSR practices.
- ✓ The transformation is happening in the foundational mechanisms of organizations, drawing our attention to a new approach in the management of both human workers and AI encountering the workforce for implementing sustainable HRM practices.
- ✓ Both AI and GHRM aim to introduce an evolutionary shift in organizations towards being aligned with the four vectors of the Intelligent Organization/Quadruple Bottom Line (Environmental, Social, Economic, and Cultural). Throughout this essay, divided into ten parts, we have theoretically substantiated and practically shown this potential in different segments of HRM to support organizational sustainability.

Results Discussion:

- ✓ Organizations should be challenged to critically consider and reflect on the types of AI they employ in their HRM practices.
- ✓ The capabilities embedded in AI/HR analytics can support HRM practices towards preempting environmental sustainability issues with their workforce.
- ✓ Shifts in human workers, HRM practices, and AI can facilitate the positioning of GHRM practices from reactive to proactive.
- ✓ In a world where sustainability is changing organizations' value propositions towards all stakeholders, HRM's role should change and offer AI-powered solutions to manage the CSR drift in the workforce.
- ✓ The theoretical substantiation provides the groundwork for organizations to build sustainability through their human workers via the AI lens. They should embark on this feature and use the relevant references to trigger broader discussion in the field by casting the Academy's views on what might lie ahead for all of us in AI-powered HRM practices, especially in light of the Ecosystem Economy mindset.

Ethical Considerations

This study is based on conceptual analysis and secondary theoretical sources. No human participants, personal data, or experimental procedures were involved. Therefore, ethical approval and informed consent were not required. The research adheres to internationally recognized standards of academic integrity, ethical scholarship, and responsible research conduct. All sources are appropriately acknowledged, and the study complies with principles of transparency, accountability, and academic honesty.

Author Contributions

- **Dr. Hamza**: Conceptualization, theoretical framework development, manuscript drafting, and integration of sustainability and AI perspectives.
- **Dr. Braham Nour Elhana**: Literature review, analytical structuring, conceptual synthesis, and academic editing.
- **Dr. Hafassa Amina**: Methodological design, conceptual validation, sustainability governance framework development, and critical revision of the manuscript.

All authors have read and approved the final version of the manuscript and take full responsibility for its content.

Acknowledgements

The authors express their sincere appreciation to their respective institutions for academic support and intellectual resources that contributed to the development of this study. Special thanks are extended to colleagues and peer scholars whose discussions and insights enriched the conceptual depth of this research.

Funding

This research did not receive any specific grant from public, commercial, or not-for-profit funding agencies.

Conflict of Interest

The authors declare no conflict of interest. There are no financial, professional, or personal relationships that could have influenced the research process or outcomes of this study.

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