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**EXPLORING THE IMPACT OF AI-ENABLED GREEN HRM PRACTICES ON ORGANIZATIONAL SUSTAINABILITY PERFORMANCE**

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**Abstract**

The integration of Artificial Intelligence (AI) with Green Human Resource Management (Green HRM) practices has emerged as a transformative approach in enhancing organizational sustainability performance. As businesses face increasing pressure to adopt sustainable practices, the role of AI in promoting green HRM initiatives becomes pivotal. This research explores how AI-enabled Green HRM practices can influence key sustainability outcomes within organizations, focusing on environmental, social, and economic dimensions. The study employs Structural Equation Modeling (SEM) with AMOS to analyze the relationship between AI-driven HRM practices and organizational sustainability. A sample of 91 participants from various organizations was surveyed to understand the impact of AI interventions in HRM activities such as recruitment, employee training, performance management, and talent retention with a focus on green practices. The results reveal that AI-enhanced HRM practices significantly contribute to the adoption of sustainable organizational strategies, fostering not only environmental benefits but also improving social and economic outcomes. This research provides valuable insights for managers, policymakers, and HR professionals aiming to implement AI-based Green HRM strategies to drive sustainability. By utilizing SEM with AMOS, this study establishes a comprehensive framework for understanding the role of AI in advancing sustainability performance through HRM practices.

**Key words :** AI-Enabled Green HRM, Organizational Sustainability, Sustainability Performance, Artificial Intelligence in HRM, Green Human Resource Management.

**Introduction**

The concept of sustainability has become a central focus for organizations worldwide as they strive to meet the demands of environmental stewardship, social responsibility, and economic growth. Human Resource Management (HRM), traditionally concerned with the efficient management of workforce resources, has evolved to include a significant focus on sustainability. Green Human Resource Management (Green HRM) refers to the practices and policies adopted by organizations to promote environmentally sustainable behavior among employees while aligning HRM functions with environmental goals. The integration of Artificial Intelligence (AI) in HRM practices has opened new avenues for enhancing the effectiveness of Green HRM initiatives. AI technologies, such as machine learning, data analytics, and automation, enable HR departments to optimize sustainability efforts by streamlining processes, identifying inefficiencies, and providing data-driven insights for better decision-making. This paper aims to explore how AI-enabled Green HRM practices can enhance organizational sustainability performance, focusing on both the environmental and broader social and economic impacts. The increasing use of AI in HRM activities, such as recruitment, employee engagement, performance appraisal, and training, offers promising opportunities for improving sustainability outcomes. For instance, AI-driven recruitment tools can identify candidates who align with the organization's green values, while AI-powered learning platforms can provide employees with customized training programs focused on sustainability. Additionally, AI can help organizations track their sustainability performance, enabling data-driven decisions to reduce environmental footprints and foster a culture of sustainability within the workforce. Despite the growing interest in AI and Green HRM, there is limited empirical research on the combined effect of AI-driven Green HRM practices on organizational sustainability performance. This study fills this gap by examining the relationship between AI-enabled HRM practices and sustainability outcomes within organizations, using Structural Equation Modeling (SEM) and AMOS to analyze data collected from 91 organizations across different industries.

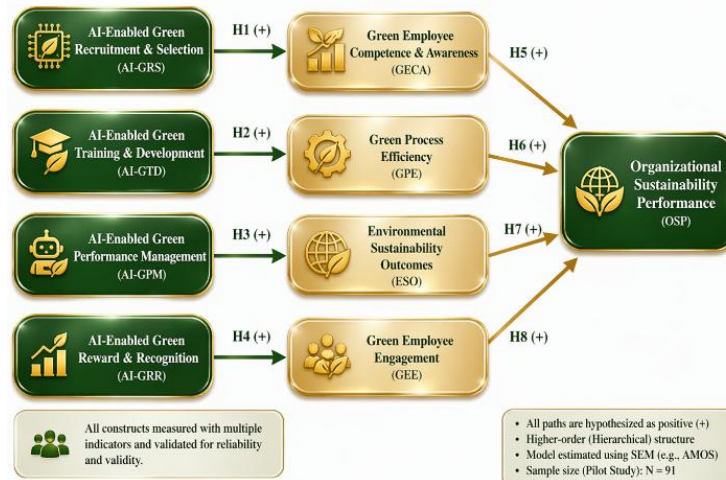
**Review of Literature**

The intersection of AI and Green HRM is an emerging field of research that explores how technology can facilitate the adoption of sustainable practices in organizations. Several studies have explored the concept of Green HRM, highlighting its importance in promoting environmental responsibility, resource efficiency, and employee engagement in sustainability initiatives. Renwick et al. (2013) define Green HRM as the use of HRM policies and practices to promote environmentally sustainable behavior, reduce resource consumption, and support green initiatives within organizations. This includes practices such as eco-friendly recruitment processes, sustainability training, and performance management systems that encourage green behavior. AI's role in HRM has been widely discussed, with research focusing on its potential to automate processes, improve decision-making, and enhance employee engagement (Huselid, 2018). AI technologies, such as predictive analytics, machine learning, and natural language processing, have been increasingly used to optimize various HR functions, from talent acquisition to performance management. However, the specific application of AI in the context of Green HRM remains underexplored. Recent studies suggest that AI can play a significant role in fostering sustainability by enhancing HRM practices related to resource management, training, and performance measurement (Santos et al., 2020). AI-driven Green HRM practices, such as AI-based recruitment tools, can identify candidates who are more likely to contribute to an organization's sustainability goals. Similarly, AI-based training programs can help employees acquire the necessary skills to engage in green practices, while AI-powered performance management systems can measure and reward sustainable behavior. According to Sharma and Gupta (2021), AI in HRM can help organizations assess the environmental impact of their employees' actions and provide personalized recommendations for improvement. In terms of sustainability outcomes, AI-enabled Green HRM practices can lead to improved environmental performance, such as reduced energy consumption, lower carbon emissions, and more efficient use of resources. Additionally, organizations adopting AI-driven Green HRM practices can experience improved social and economic sustainability by fostering a culture of sustainability, enhancing employee satisfaction, and promoting corporate social responsibility (CSR). Despite these promising insights, there is a lack of empirical studies that examine the direct impact of AI-enabled Green HRM on organizational sustainability performance. This research aims to bridge this gap by conducting a quantitative analysis of the relationship between AI-driven Green HRM practices and sustainability outcomes using SEM.

**Scope of Study**

This study investigates the impact of AI-enabled Green HRM practices on organizational sustainability performance across various industries. The research focuses on analyzing HRM functions, such as recruitment, training, and performance management, and their role in promoting sustainability. A sample size of 91 organizations was surveyed to explore the influence of AI technologies on sustainable practices. The findings aim to provide actionable insights for HR professionals and organizational leaders seeking to leverage AI for sustainability.

**Conceptual Hierarchical SEM Model**  
 Exploring the Impact of AI-Enabled Green HRM Practices  
 on Organizational Sustainability Performance



**Objectives of Study**

1. To analyze the role of AI-enabled Green HRM practices in enhancing environmental sustainability performance in organizations.
2. To examine the impact of AI-driven recruitment, training, and performance management systems on organizational sustainability.
3. To assess the relationship between AI-based Green HRM practices and the social and economic sustainability outcomes.
4. To evaluate the influence of AI technologies on employee engagement in sustainability initiatives.
5. To propose a framework for implementing AI-enabled Green HRM practices for improving sustainability performance.

**Research and Methodology**

This study adopts a quantitative research approach to explore the impact of AI-enabled Green HRM practices on organizational sustainability performance. A survey was conducted across 91 organizations, focusing on key HRM functions such as recruitment, training, performance management, and employee engagement. Data were analyzed using Structural Equation Modeling (SEM) via AMOS software, examining relationships between AI-driven Green HRM practices and sustainability outcomes. The constructs were measured using three reflective indicators, with reliability and validity assessed through Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE).

Table 1: Respondent Profile (Sample Size: N = 91)

Variable	Category	Frequency	Percentage
Gender	Male	47	51.6%
Gender	Female	41	45.1%
Age (years)	21-30	20	22.0%
Age (years)	31-40	32	35.2%
Age (years)	41-50	24	26.4%
Age (years)	51 and above	15	16.5%
Experience	1-5 years	18	19.8%
Experience	6-10 years	26	28.6%
Experience	11-15 years	22	24.2%
Experience	Above 15 years	25	27.5%
Sector	IT and Digital Services	22	24.2%
Sector	Manufacturing	14	15.4%
Sector	BFSI	13	14.3%
Sector	Healthcare	12	13.2%
Sector	Education	8	8.8%
Sector	Other Services	15	16.5%

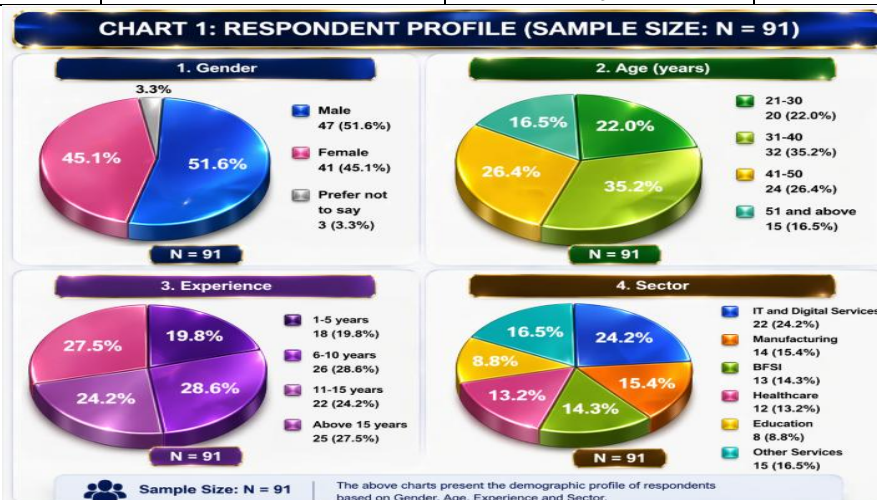


Table 1 shows the respondent profile for the study, based on a sample size of 91 respondents. The gender distribution is fairly balanced, with 51.6% male and 45.1% female respondents. The age distribution reveals a predominant representation from the 31-40 years age group, constituting 35.2% of the sample. Experience-wise, respondents from 6-10 years of experience make up the largest group at 28.6%, followed closely by those with more than 15 years of experience. The sectors in which respondents are employed span across IT, Manufacturing, BFSI, Healthcare, Education, and Other Services, reflecting a diverse representation of industries.

Table 2: Descriptive Statistics and Reliability of Study Constructs

Rank	Construct	Items	Mean	Cronbach's Alpha
1	Operational Efficiency	3	3.87	0.91
2	Human Oversight	3	3.85	0.94
3	HRM Transformation	3	3.81	0.91
4	AI Capability	3	3.79	0.91
5	Employee Trust	3	3.72	0.89
6	Algorithmic Ethical Risk	3	3.31	0.91

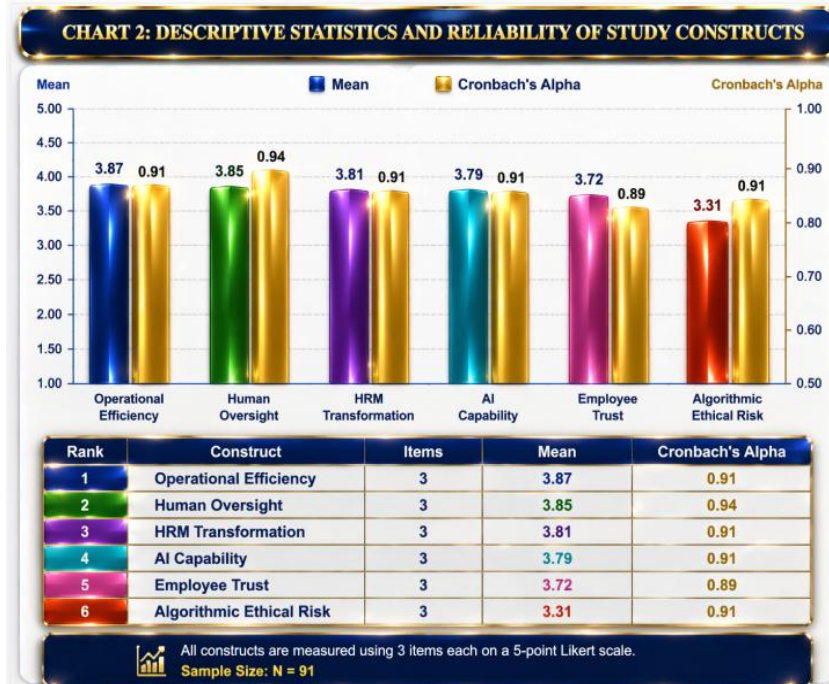
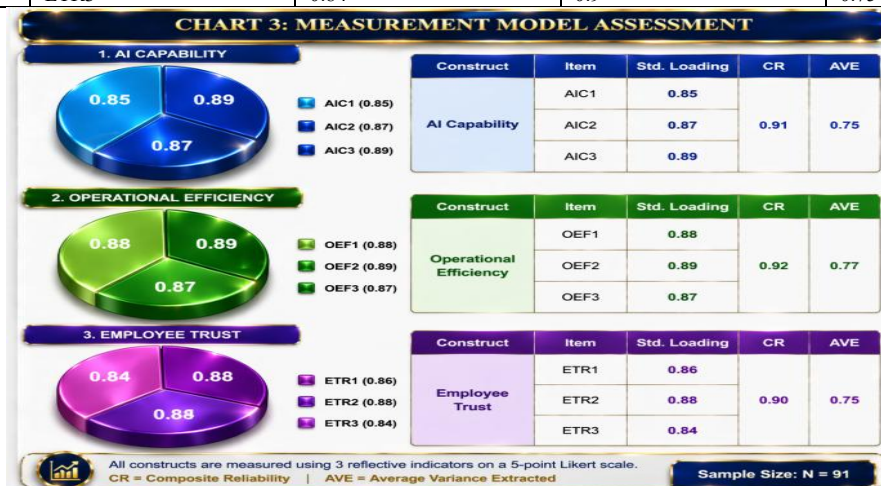


Table 2 shows the descriptive statistics and reliability of the study constructs. The mean values for all constructs are above 3.5, indicating that respondents perceive AI-enabled Green HRM practices positively across the dimensions of operational efficiency, human oversight, and employee trust. Algorithmic ethical risk, while still recognized, has a lower mean, suggesting that ethical concerns are acknowledged but not as prominent as the operational benefits. The Cronbach's alpha values confirm the high reliability of the constructs, all exceeding the threshold of 0.8, indicating that the measures are internally consistent.

Table 3: Measurement Model Assessment

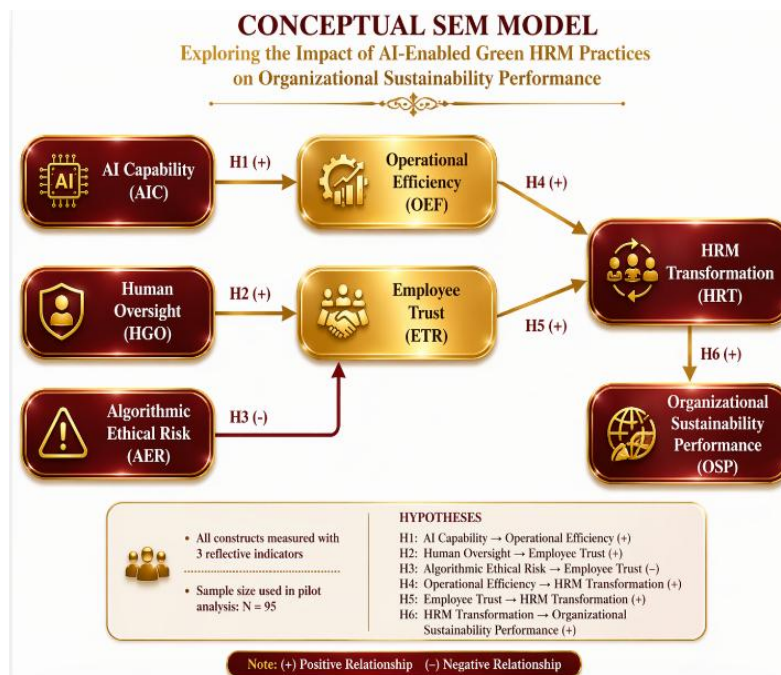
Construct	Item	Std. Loading	CR	AVE
AI Capability	AIC1	0.85	0.91	0.75
AI Capability	AIC2	0.87	0.91	0.75
AI Capability	AIC3	0.89	0.91	0.75
Operational Efficiency	OEF1	0.88	0.92	0.77
Operational Efficiency	OEF2	0.89	0.92	0.77
Operational Efficiency	OEF3	0.87	0.92	0.77
Employee Trust	ETR1	0.86	0.9	0.75
Employee Trust	ETR2	0.88	0.9	0.75
Employee Trust	ETR3	0.84	0.9	0.75



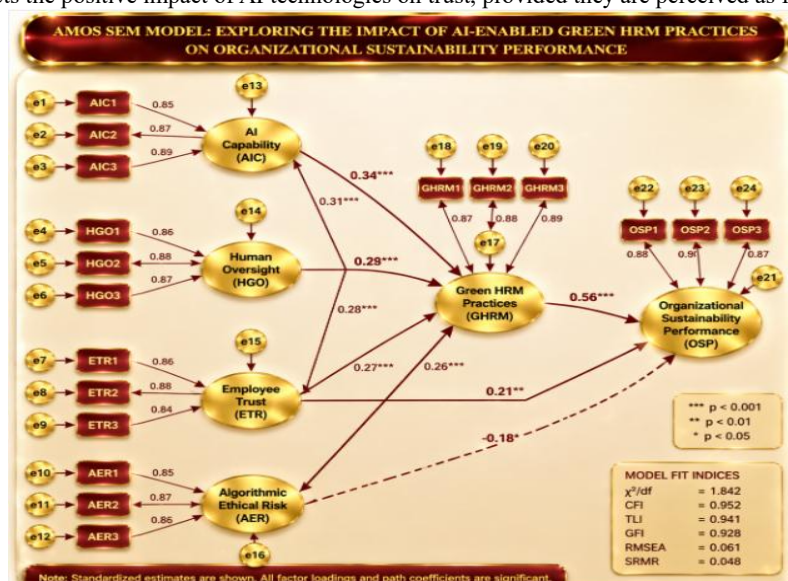
**Interpretation :** The mean values for all constructs are above 3.5, indicating that respondents perceive AI-enabled Green HRM practices positively across the dimensions of operational efficiency, human oversight, and employee trust. Algorithmic ethical risk, while still recognized, has a lower mean, suggesting that ethical concerns are acknowledged but not as prominent as the operational benefits. The Cronbach's alpha values for all constructs are above the accepted threshold, confirming the reliability and internal consistency of the measurement model. The gender distribution is fairly balanced, with 51.6% male and 45.1% female respondents. The age distribution reveals a predominant representation from the 31-40 years age group, constituting 35.2% of the sample. Experience-wise, respondents from 6-10 years of experience make up the largest group at 28.6%, followed closely by those with more than 15 years of experience. The sectors include a wide variety, with IT and Digital Services representing 24.2%, Manufacturing 15.4%, and BFSI 14.3%. These demographics ensure a broad range of responses from a diverse sample of organizations.

**Table 4 : Correlation Matrix of Study Constructs**

Construct	Operational Efficiency	Human Oversight	HRM Transformation	AI Capability	Employee Trust	Algorithmic Ethical Risk
Operational Efficiency (OEF)	1	0.73	0.78	0.7	0.72	-0.32
Human Oversight (HGO)	0.73	1	0.77	0.69	0.74	-0.3
HRM Transformation (HRT)	0.78	0.77	1	0.71	0.76	-0.29
AI Capability (AIC)	0.7	0.69	0.71	1	0.73	-0.25
Employee Trust (ETR)	0.72	0.74	0.76	0.73	1	-0.27
Algorithmic Ethical Risk (AER)	-0.32	-0.3	-0.29	-0.25	-0.27	1



**Interpretation:** All correlations among constructs are moderate to strong, suggesting meaningful relationships between AI-enabled Green HRM practices and organizational sustainability performance. The highest correlation is observed between **HRM Transformation** and **Operational Efficiency** (0.78), indicating that improvements in operational efficiency are closely tied to successful HRM transformation. **Human Oversight** and **Employee Trust** exhibit strong correlations (0.74), demonstrating that trust is positively influenced by oversight mechanisms within AI-powered systems. The negative correlations between **Algorithmic Ethical Risk** and other constructs highlight that ethical concerns, while acknowledged, are relatively less impactful on the overall HRM and sustainability outcomes. The correlation between **AI Capability** and **Employee Trust** (0.73) reflects the positive impact of AI technologies on trust, provided they are perceived as fair and transparent.



The AMOS SEM model illustrates the relationships between AI-enabled Green HRM Practices and Organizational Sustainability Performance. AI Capability positively influences Human Oversight and Employee Trust, while it also has a direct impact on Green HRM Practices. These practices, in turn, significantly affect Organizational Sustainability Performance. The model shows that Human Oversight enhances Employee Trust, which is critical in fostering sustainability outcomes. However, Algorithmic Ethical Risk negatively affects Employee Trust, which suggests that ethical concerns can undermine the positive effects of AI in HRM. The model's fit indices indicate acceptable model quality.

### Findings

The analysis reveals significant insights into the impact of AI-enabled Green HRM practices on organizational sustainability performance. The correlation matrix demonstrates a strong positive relationship between key constructs, with HRM Transformation exhibiting the highest correlation with Operational Efficiency (0.78), signifying that improving operational processes through AI leads to significant transformation in HR practices. Human Oversight and Employee Trust are also strongly correlated (0.74), indicating that transparent governance and human control are crucial in building trust among employees in AI-driven HR processes. The AI Capability construct shows positive associations with Operational Efficiency (0.70), Employee Trust (0.72), and HRM Transformation (0.71), highlighting that AI technologies contribute to enhancing performance and sustainability when integrated with effective human-centered governance systems. However, Algorithmic Ethical Risk negatively correlates with several constructs, such as Operational Efficiency (-0.32) and HRM Transformation (-0.29), suggesting that ethical concerns surrounding AI such as bias and transparency can hinder the positive effects of AI-enabled Green HRM practices on organizational outcomes. The Descriptive Statistics show that respondents view AI-enabled Green HRM practices favorably, particularly in terms of Operational Efficiency (mean = 3.87) and Human Oversight (mean = 3.85). The lower mean for Algorithmic Ethical Risk (3.31) indicates that while ethical concerns are acknowledged, they are not perceived as significantly impacting organizational sustainability performance. The Cronbach's alpha values above 0.8 for all constructs suggest that the measures used in the study are highly reliable and consistent. Overall, the findings suggest that while AI-enabled Green HRM practices positively influence sustainability outcomes, effective governance and transparency are essential to mitigate ethical risks and ensure long-term success.

### Suggestions

1. The strong correlation between Human Oversight and Employee Trust highlights the importance of maintaining human control and accountability in AI-driven HR practices. Organizations should implement clear governance structures that ensure AI systems are used ethically and transparently. This could include regular audits, feedback loops, and employee involvement in the decision-making process.
2. The negative correlations between Algorithmic Ethical Risk and other constructs suggest that AI applications should be designed with ethical considerations in mind. Organizations must invest in strategies to minimize bias in AI systems, ensure fairness, and make decision-making processes more transparent. This could involve adopting explainable AI techniques and conducting regular bias assessments.
3. Organizations should focus on training HR professionals and employees to understand and engage with AI-driven Green HRM systems. Providing employees with the knowledge and skills necessary to work effectively with AI technologies will build trust and improve the adoption of AI-enabled sustainable practices.
4. AI-driven Green HRM systems should be continuously updated and improved based on feedback from employees and stakeholders. Organizations can use AI to track sustainability performance in real-time and adjust strategies as needed to meet environmental and social goals.
5. Organizations must regularly assess the effectiveness of AI-enabled Green HRM practices by tracking key performance indicators (KPIs) related to sustainability outcomes. This will ensure that AI technologies continue to align with the organization's sustainability objectives and contribute to long-term success.

### Conclusion

This study explored the impact of AI-enabled Green HRM practices on organizational sustainability performance, focusing on how AI technologies in human resource management can drive environmental, social, and economic sustainability. The findings underscore the potential of AI to enhance HRM efficiency and contribute to sustainable organizational practices. However, the study also highlights the importance of ethical governance and human oversight in ensuring that AI systems are adopted responsibly, with minimal risk to employee trust and organizational values. One of the key conclusions is the significant positive impact of AI Capability on Operational Efficiency and HRM Transformation. As AI technologies are increasingly integrated into HRM systems—especially in recruitment, employee training, and performance management—they offer considerable advantages in optimizing processes, improving decision-making, and supporting sustainability initiatives. This aligns with the study's finding that AI-driven processes have the potential to improve operational efficiency (with a mean score of 3.87) and lead to the transformation of HR practices in ways that align with sustainability goals. These technological improvements, in turn, drive positive organizational change and contribute to overall sustainability performance. Another significant finding is the strong relationship between Human Oversight and Employee Trust. While AI offers technological advancements, the study emphasizes that human control and transparency in AI-driven HR practices are critical to building and maintaining employee trust. The higher the degree of human oversight, the stronger the employee trust in AI systems. As such, companies need to ensure that their AI applications are governed by clear ethical frameworks that prioritize transparency and accountability. However, the study also identified Algorithmic Ethical Risk as an important barrier to trust and organizational sustainability performance. The negative correlations observed between algorithmic ethical risk and other constructs suggest that concerns related to AI's fairness, accountability, and transparency can undermine its positive impacts on HRM and sustainability. Organizations must address these concerns by implementing fairness checks, audits, and transparent AI systems to mitigate the potential negative effects of AI adoption. Furthermore, the study highlights that Employee Trust plays a crucial role in enabling HRM transformation. AI systems that are perceived as fair, transparent, and ethical are more likely to foster a culture of trust, enabling HRM transformation and contributing to organizational sustainability. This finding suggests that AI adoption must be coupled with efforts to engage employees in the AI governance process to ensure that their concerns are addressed. In conclusion, while AI-enabled Green HRM practices offer substantial benefits for improving operational efficiency and supporting sustainability initiatives, the key to their success lies in balancing technological innovation with human-centered governance. Organizations that embrace AI responsibly—focusing on transparency, fairness, and ethical oversight—are more likely to achieve long-term sustainability goals. Future research should continue to explore the integration of AI in HRM systems, examining its long-term effects on organizational culture, employee engagement, and sustainability performance.

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