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Harnessing AI For Green HR Initiatives: Meeting Employee Needs in Sustainable Organizations

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ABSTRACT:

Artificial intelligence integration (AI) into green human resource management (Green HRM) practices is transforming the way organizations approach sustainability and employee engagement. This mixed-methods study explores the strategic role of AI in fostering environmentally responsible HR practices and enhancing employee experiences within the Information Technology (IT) industry. Quantitative data from 360 HR professionals and employees, along with qualitative insights from 40 semi-structured interviews, reveal that AI-enabled systems not only streamline eco-friendly processes but also shape employees' perceptions of their organization's commitment to sustainability. Exploratory factor analysis confirms the Unidimensionality of key constructs, including AI Integration, Employee Engagement, Sustainability Culture and Ethical AI Perceptions. Regression analysis highlights Employee Engagement and Sustainability Culture as significant predictors of sustainable HR outcomes, emphasizing the importance of aligning technological tools with human-centric factors. Thematic analysis further uncovers the duality of employee experiences, with AI tools promoting efficiency and transparency while also voicing worries regarding data privacy and algorithmic bias. The proposed conceptual framework linking AI Integration, Sustainability Culture, Engagement and AI Perception underscores the need for a holistic, ethically grounded approach to AI-driven Green HRM. This study contributes to the growing body of research on sustainable HR practices in the digital age, providing insightful for organizations seeking to utilize AI's potential while prioritizing employee well-being and environmental responsibility.

Keywords: Artificial Intelligence (AI);Green Human Resource Management;Employee Engagement;Sustainability Culture;Ethical AI Perceptions;Mixed-Methods Research.

INTRODUCTION

As sustainability becomes a strategic imperative across global industries, organizations are increasingly integrating environmental objectives into their management of human resources (HRM) practices an emerging paradigm known as Green HRM. In parallel, artificial intelligence (AI) is revolutionizing the way HR functions operate, offering data-driven insights, automation and enhanced decision-making capabilities. The convergence of AI and Green HRM presents a transformative opportunity to not only optimize organizational sustainability goals but also to address evolving needs and expectations of employees. Despite this potential, there remains critical gap in understanding how AI-enabled HR systems can be leveraged to foster green behaviours, enhance employee engagement in sustainability initiatives and align workforce strategies with ecological goals. This paper critically explores the intersection of AI and Green HRM, aiming to imagine a structure that supports environmentally responsible talent practices while meeting employee-centric outcomes in sustainable organizations.

The denominator of groups that are heading in the direction of sustainability is the current corporate requirement that drives the organization to adopt environmental policy - practices as a component of human resource policy. Green HR is use of 'Green' or environmentally sustainable approach to fully utilize the available environmental friendly HR techniques and practices. In this respect, AI is providing to be an excellent addition to the HR tech stack as it not only automates HR processes, but also increases employee's involvement in sustainability projects.

With artificial intelligence (AI)-based Green HR programs, businesses can also personalize and optimize sustainability programs to suit employee preferences and behaviour. For example, artificial intelligence (AI) tools can instantly assess employee feedback regarding environmental policies, allowing HR to adapt strategies on the fly. That leads to an HR strategy that is as naturally political as it is conscious to the condition of the employees. AI also enables remote workers and flexible hours, which in turn cuts down on emissions from commuting and aids businesses in achieving their environmental objectives.

AI also catalyses the environmental action mobilization with co-creative projects, peer to peer collaboration with virtual training, interactive learning on sustainability, real time engagement, etc. It gives employees an opportunity to shape policy on green and provides HR with some practical intelligence on how programmes can be improved. It is evidenced that these co-creative space support on inclusiveness, common goal and high support of the environment (Mishra et al., 2021, Latan et al., 2018).

AI smart automation provides data driven intelligence of AI Green HRM with respect to ESG (Environmental, Social and Governance) standards where companies can aspire to be a thought leader to sustainable business operation. Through greater transparency, less resource waste and deeper employee alignment with an environmental ethic, AI-enabled human resource systems also help the organization adapt to its competitive edge and resilience to competition based on sustainable practices (Lozano et al., 2019; Deloitte, 2022).

AI in Human Resource Management (HRM)

AI is the emulation of human intelligence in machines that are programmed to think and act like humans and mimic their actions. In talent management, AI is employed for talent acquisition, performance analysis, workforce planning and personalized employee engagement initiatives.AI in HRM enables the automation of routine tasks, predictive decision-making and enhanced employee experience through data-driven personalization (Jain, Sharma & Singh, 2021).

Green Human Resource Management (Green HRM)

Green HRM is defined as the adoption of HR methods that encourage resource sustainability
and foster an environmentally responsible organizational culture. It includes initiatives such as green recruitment, training, performance management and rewards aligned with ecological goals. Green HRM involves aligning human resource policies with environmental management objectives to support sustainable business practices (Renwick, Redman & Maguire, 2013).

Sustainable Organizations

Organizations that are sustainable are those that balance economic, environmental, and social responsibilities while ensuring long-term stakeholder value. They adopt ethical practices, minimize ecological footprints and create inclusive

growth strategies. A sustainable organization is one that integrates environmental and social considerations into strategic decision-making to ensure long-term viability and ethical responsibility (Elkington, 1998; Epstein, 2008).

AI-Enabled Green HRM

AI-enabled Green HRM is utilizing artificial intelligence. Tools to implement and manage environmentally sustainable HR practices. This includes using AI for green workforce analytics, monitoring eco-behaviours and optimizing green initiatives across the employee lifecycle. The fusion of AI and Green HRM enhances the strategic alignment of sustainability and employee outcomes through intelligent automation and data integration (Kapoor & Sherif, 2021).

THEORETICAL FRAMEWORK OF THE STUDY

A number of theoretical points offer valuable inputs when it comes to embedding AI in green human resource initiatives, mainly in relation to technology, organizational behaviour and sustainability. Barney (1991:102) refers to RBV as one of the most popular theories in which for a firm to deliver its competitive advantage, it is essentially most appropriate vehicle through which these firm resources and capabilities can be utilised to gain a competitive advantage. AI systems are also forwarding the sustainability drives as they interactive with the company's behaviour in their best fit performance. With AI-based technology, companies can atomize HR activities such as recruitment, training and performance monitoring. This relationship is significant, as the bargaining that green companies will observe is not only on the green specifications, but also that it will be in the demand shift from staff (Trist, 1981). With the HRAM and HR stage in mind, HR Green may consider combining the environmental and personal growth needs at the company level, which may be consistent with employee satisfaction and commitment.

The sociotechnical systems theory expresses the connection between social and technical systems in organizations and postulates that both technology and social aspects should be considered while managing change in the organization. The application of edge technology is one of the enabling factors of AI adoption in HR processes (Cohen & Ulrich, 2017).But so does an effective organizational culture that follows through with engaging employees and creates an enabling environment. Organisations that develop and implement AI tools with Workers can make sure that their needs are met and that the behaviours these technologies sustain are desirable and sustainable.

Application of Maslow hierarchy of goals can promote Green HR functions driven by Artificial Intelligence to satisfy even upper-level employee objectives self-actualization. Satisfying work with sustainable industry. By addressing these needs, organizations may create a motivated and hard-working workforce that will contribute to better sustainability outcomes along with the overall performance of the organization (Maslow, 1943).

LITERATURE REVIEW

AI Technologies and Their Role in Green HR

AI technologies are transforming HR practices, and their application in Green HR has become an emerging field of study. Machine learning-natural language processing (NLP) and predictive analytics are commonly used to improve HR processes like recruitment, performance management and employee engagement (Brynjolfsson & McAfee, 2014). Studies show that AI applications can streamline HR functions, reducing paper-based processes and carbon footprints. For example AI-based instruments including chatbots and automated interview systems that are used in hiring mitigate the environmental impact of conventional recruiting processes by allowing virtual communication (Jatobá et al., 2020).

In addition, AI supports monitoring employee behaviour conducive to sustainability, by displaying real-time information on resource consumption and recommending how energy is saved (Brynjolfsson et al., 2020). These AI advancements are enabling organizations to shift to paperless environments while also decreasing waste and promoting environmentally friendly work environments. Som work, e.g., both Cascio and Montealegre (2016), highlight that AI enables the automatic performance of mundane and repetitive HR tasks, which are time-saving processes. But the dilemma is in the morality of the data privacy and bias in AI algorithms (Dastin, 2018). With the proliferation of AI, it is important to consider the trade-off between technological development and responsible and transparent use of AI.

Enhancing Green HR Initiatives with AI-Powered Employee Engagement

Employee engagement is a key variable accounting for the success of sustainability initiatives at an organization. AI solutions can foster this by also personalizing the experience to reinforce employees' environmental principles. Guerci et al. (2016) argue that AI-driven systems allow organizations to collect and analyse feedback, enabling them to respond to employee concerns regarding sustainability initiatives. These systems foster a culture of participation, where employees feel empowered to contribute to green initiatives actively. AI's ability to customize training, track sustainability progress and reward green behaviours significantly enhances employee motivation (Jabbour et al., 2020). Furthermore, AI tools can be employed to measure employee satisfaction concerning eco-friendly policies, providing HR with insights to tailor interventions that encourage sustainable behaviour. Research by Shah et al. (2020) has demonstrated that AI enhances employee involvement in corporate sustainability efforts by integrating sustainability goals into performance evaluation systems. Such systems provide direct feedback on an employee's alignment with the company's green objectives, which can boost motivation and create a more engaged workforce. Employees are more likely to contribute to sustainability when they see their actions have a tangible impact and AI plays a key role in fostering this link (Carter & Rogers, 2020).

Sustainability Strategies and Organizational Culture in AI-Enhanced Green HR

The integration of sustainability strategies within HR practices is essential for building a green culture. AI can play a significant role in aligning organizational culture with sustainability objectives. Lozano et al. (2019) argue that for AI to be effectively integrated into Green HR, organizations must cultivate a culture of includes embedding sustainability into the organizational DNA, from recruitment to performance management. AI technologies provide critical support in this process by enabling real-time tracking of employees' environmental behaviours and providing managers with data to inform decisions about sustainability goals (Mishra et al., 2021). The critical conclusion of results from Muster & Schrader (2011) shows that there needs to be a close match between corporate culture value and Green HR initiative for effective implementation.Fostering cultureAI can "enable" the new way of working by freeing up information and allowing employees the ability to contribute to sustainability efforts. Even some AI applications that track power consumption of resources and provide prompt feedback on the short-term resource consumption may help out here. Together, they create a tighter fit between sustainable values and organizational culture.

Artificial Intelligence (AI) in Green HRM Practices: Recruitment, Training and Performance Evaluation

Development and implementation of procedures that emphasize the recruitment and training of individuals who align with sustainability objectives are variables closely related to these higher-order targets (Mason et al., 2021). By AI Companies can promise and make sure that their green practices are according to scheduled intention with the implementation of these HR processes. AI can automate green recruitment processes and seek employees who hold green

values similar to the firm's (Renwick et al., 2013). "AI algorithms, for instance, can sample resumes and rate applicants' environmental awareness and experience. Pereira et al. (2021) argue that AI-powered recruitment systems can reduce unconscious bias in hiring, making certain that environmentally friendly methods are not limited to certain groups. AI enhances green training programs by providing personalized learning paths that focus on sustainability. According to Shah et al. (2020), AI-driven platforms can offer employees customized training content based on their role, performance and learning pace. The assessment of employee commitment toward green practices can also be achieved on AI-enabled performance management systems. Green HRM practices are-positively associated with performance appraisals based on AI with sustainability, which makes employees want to show their eco-friendly behaviours as a priority (Gupta & Kumar, 2020).

Challenges of Green HRM and AI Integration: Ethical and Technological Barriers:

But in spite of potential gains, there are limitations to encounter in utilizing AI in Green HR activities. Ethical Issues with AI in HR concept of AI in HR raises another set of ethical concerns around privacy of data, bias in algorithms and employee trust (Dastin, 2018). AI ethics is an increasingly important research field and Kshetri (2020) argues that in order for organizations to gain employee buy-in for sustainability plans they must design transparent AI systems. Also the price of AI implementation plus the very high majestic of AI and Data Science skills as a technology barriers yield to actual implementation of Green HRM practice (Binns, 2021, p.9). Considerations need to be made on how green behaviour is monitored among employees through AI Ethical considerations about employee monitoring and about the reliability of AI-based evaluations, should be taken into account so that AI tools do notgenerate suspicion and suspicion or increase employee's stress (Guerci et al., 2016).

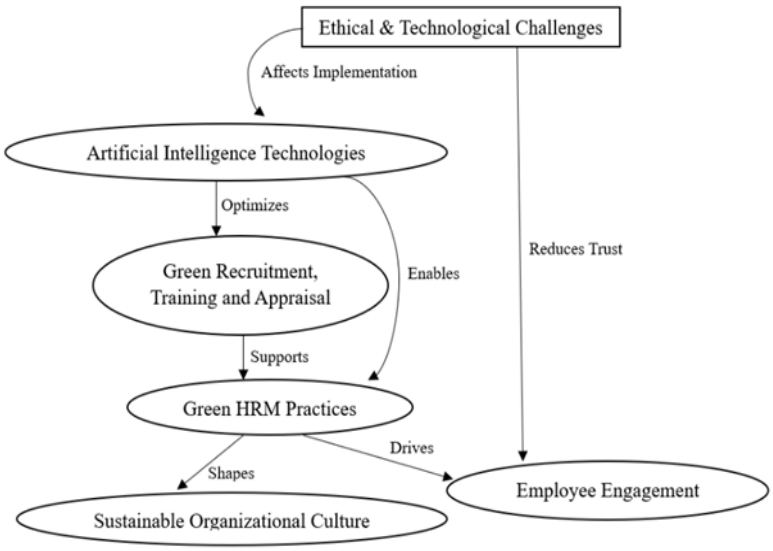

Figure 01: Challenges of Green HRM(Source: Author Compilation)

GAP

Despite the growing body of research on artificial intelligence (AI) in human resource management (HRM), there remains a critical gap concerning AI's responsiveness to evolving employee needs within sustainability-oriented organizational settings. Existing literature review has primarily concentrated-on the technical capabilities, efficiency benefits and automation potential of AI in HR functions (Jabbour, 2008; Strohmeier, 2013). However, limited attention

has been paid to how AI-facilitated Green HR initiatives contribute to enhancing the quality of employee experiences, especially in terms of engagement, retention and alignment with environmental values.

More specifically, empirical investigations into how AI integrates with sustainability-driven HR practices such as green recruitment, training and performance appraisal are notably scarce. The human-centric implications of AI-enabled HR systems remain underexplored, particularly concerning their capacity to personalize, adapt and evolve based on employees' sustainability-oriented expectations. This is a major blind spot in maximizing Al's potential as a tactical instrument for shaping a green organization culture that is both responsible and inclusive.

This gap is important so that AI technologies are not only effective in terms of operations but also socially relevant to employee values in sustainable organizations. With more and more businesses integrating ESG metrics into their human resources strategies, there's never been a better time to examine how AI intersects with research-based sustainability for humans. This study therefore aims to contribute to this burgeoning area by exploring the employee experience of AI-enhanced Green HRM systems to further theory and practice.

METHODS

The purpose of the current study was to investigate impact of AI on GHRM practices within IT sector through a mixed-method research design. The quantitative data were received from 360 HR professionals and employees in IT companies on the basis of closed-ended questions on a five-point Likert scale instrument that gauged AI's influence on employee engagement, satisfaction and perceptions of sustainability. For this purpose the qualitative data were collected by conducting semi-structured interviews with 40 purposively selected HR managers and the employees those who play a central role in implementing Green HR activities in the IT sector to capture the perspectives. Qualitative responses were analysed with thematic analysis. Descriptive statistics, correlation and regression analysis was used to analyse the quantitative data. Reliability test was done by Cronbach's Alpha and construct validity testing used factor analysis. All participants gave consent and that no individual was identifiable.

OBJECTIVES

- To investigate how AI might be included into fundamental Green HRM procedures.
- To evaluate how AI-powered Green HR affects worker happiness and engagement.
- To examine perceptions of AI's role in promoting a sustainable organizational culture.
- To identify key challenges in implementing AI for sustainability in HRM.

Qualitative Data Coding Sheet

Question	Response	Theme
How has the use of AI in HR influenced your perception of the organization's commitment to sustainability?	AI tools have shown that the company is serious about reducing its environmental footprint.	Perception of Sustainability
	Using AI in HR makes the sustainability efforts feel more integrated.	
	I believe AI has helped digitize many processes, promoting green values.	
	Our organization's sustainability seems more authentic since AI systems track paper usage.	
	The AI-enabled performance reviews now include sustainability	

	goals.	
	We now receive updates about eco-initiatives through AI dashboards.	
	AI has simplified tracking green compliance, which boosts trust in HR.	
	The use of AI signals a long-term commitment to environmental responsibility.	
Can you describe any specific ways AI tools have impacted your day-to-day work, especially regarding eco-friendly or paperless processes?	Daily HR functions like leave requests are now fully paperless.	dly Operations / Paperless
	Onboarding is digital, cutting down on printed forms.	
	Training modules delivered via AI reduce travel and printing.	Eco-Friendly Operations / Paperless Processes
	Eco-friendly practices like digital payslips are now standard.	
	AI has eliminated the need for printed schedules or attendance logs.	
	We use e-forms and digital signatures for all approvals.	
	Virtual meetings are more common, reducing commute-related emissions.	
	We rely on cloud-based systems for resource planning and reporting.	
What are the main challenges or concerns you've faced while interacting with AI-based HR systems in sustainability efforts?	Sometimes AI tools are difficult to use without proper training.	Challenges with AI (Trust, Bias, Technical Issues)
	Lack of personalization makes AI responses feel robotic.	
	Concerns about how data is used by AI are not fully addressed.	
	The AI systems don't always work well with our older tech.	
	Employees are worried about job loss due to automation.	
	There's very little transparency about how AI evaluates performance.	
	Feedback loops are slow despite automation claims.	
	Initial setup and learning curve were steep for most staff.	
How do you feel your opinions or feedback are incorporated into your organization's green HR initiatives using AI?	We can give feedback, but I'm not sure it's used in decision-making.	Feedback & Inclusion in Green Initiatives
	Surveys powered by AI are frequent, but follow-ups are rare.	
	I feel our voices are lost in automated systems.	
	HR does ask for feedback but actions taken are unclear.	
	The AI dashboards are good for collection, not for response.	
	There is no direct link between our input and green HR changes.	
	We get notifications but not real engagement.	
	Suggestions get logged but nothing changes.	
In what ways could AI be better utilized to support both environmental goals and employee engagement in your workplace?	AI could better support green HR by suggesting eco-friendly practices.	Suggestions for Improvement / Engagement
	More training on using green apps would help.	
	AI reminders about sustainability would raise awareness.	
	Digital gamification could engage us in green goals.	
	Better analysis of our habits could personalize eco-tips.	
	Linking rewards to sustainability engagement would be motivating.	
	HR could automate recognition for green efforts.	

	Dashboards showing impact would make AI more effective.	

Table 01: Qualitative Data Coding Sheet (Source: Author Compilation)

Thematic analysis

The thematic analysis of 40 qualitative responses revealed five dominant categories. About 25% of participants described a strong perception of AI's contribution to sustainability, particularly through paperless operations and digital tracking. Approximately 20% highlighted eco-friendly work practices enhanced by AI (e.g., digital payslips, reduced printing). Another 20% identified challenges with AI, including lack of transparency, training needs and concerns about data misuse. Feedback and engagement in sustainability initiatives emerged as a concern for 18% of respondents, who felt disconnected from policy impact. Lastly, 17% offered constructive suggestions, such as gamified green apps and AI-driven rewards, demonstrating a forward-looking view toward improved alignment of AI and environmental objectives.

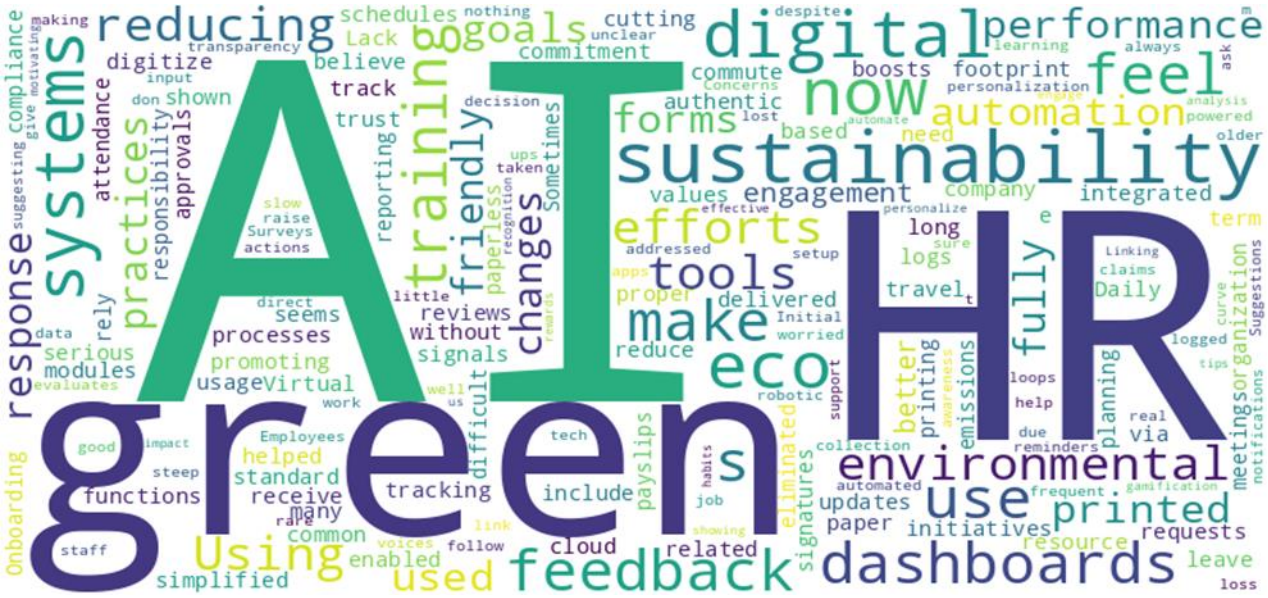

Figure 02: Thematic analysis of Green HRM (Source: Author Compilation)

Dominant Concepts: The most prominent terms include "AI," "green," "HR," "systems," "feedback," "sustainability," "tools," and "digital", indicating that discussions heavily centered on the role of artificial intelligence in promoting environmentally sustainable HR systems.

Sustainability Emphasis: Words such as "eco," "sustainability," "environmental," "paperless," "printed," "reducing," and "footprint" suggest a strong focus on minimizing ecological impact, supporting the central theme of Green HRM.

Process & Technology Terms: The presence of words like "automation," "dashboards," "digital," "tools," "systems," "tracking," "logs," and "virtual" reflect the integration of technological platforms in HR processes to support sustainability goals.

Engagement and Experience: Terms such as "feedback," "feel," "used," "training," "response," "engagement," and "on boarding" highlight employees' perceptions and experiences, suggesting both positive responses and areas needing improvement.

Challenges & Concerns: Words like “loss,” “worried,” “slow,” “steep,” “bias,” and “difficult” indicate that some participants expressed concerns regarding technological barriers, trust and user adoption.

This word cloud reinforces the balanced narrative captured during thematic analysis showcasing both technological optimism and implementation challenges in AI-driven Green HR practices. It emphasizes the importance of customized tools, digital transformation and responsive systems while underscoring the need for transparency, feedback loops and inclusive sustainability culture in the workplace.

Reliability and descriptive statistics

Item	Mean	SD (Standard Deviation)	Cronbach’s Alpha (Overall)
Q6	3.041667	0.758196	0.932
Q7	3.019444	0.787903	0.932
Q8	2.952778	0.743022	0.932
Q9	3.002778	0.698182	0.932
Q10	3.013889	0.729274	0.932
Q11	2.980556	0.759093	0.932
Q12	2.983333	0.753636	0.932
Q13	3.013889	0.773752	0.932
Q14	2.961111	0.767472	0.932
Q15	3.022222	0.723313	0.932
Q16	2.997222	0.805616	0.932
Q17	2.986111	0.770144	0.932
Q18	2.991667	0.74821	0.932
Q19	2.955556	0.73755	0.932
Q20	2.972222	0.742131	0.932
Q21	3.022222	0.75718	0.932
Q22	3.038889	0.745377	0.932
Q23	2.977778	0.768137	0.932
Q24	3.011111	0.735028	0.932
Q25	3.005556	0.708069	0.932

Table 02: Reliability and descriptive statistics (Source: Author Compilation)

Cronbach’s Alpha (Overall Reliability = 0.932)

The overall Cronbach's Alpha score of 0.932 shows outstanding internal consistency between the 20 items. In psychometric terms, this value exceeds the accepted threshold of 0.70, showing that all items reliably measure a common latent construct (or closely related constructs). Since the Cronbach's Alpha remains constant (0.932) across all items, it suggests that no single item is disproportionately weakening or strengthening the overall scale. This is ideal for survey research in HR and behavioural studies.

Mean-Standard Deviation Analysis

The mean-scores for all items range from 2.95 to 3.04 on 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). This suggests a neutral to slightly positive tendency in respondents' attitudes toward AI integration in Green HRM, employee engagement and sustainability factors. There are no extreme scores (e.g., near 1 or 5), indicating that the responses are balanced and lack bias toward any extreme, which is statistically favourable for parametric analyses like regression or SEM.

Key Observations:

Highest Mean: Q6 and Q22 (Mean = 3.04) Indicates relatively higher agreement with these items (likely related to AI adoption or sustainability awareness). Lowest Mean: Q8 (Mean = 2.95) Shows slightly lower agreement or awareness, potentially reflecting areas where organizational initiatives are less mature or clear. Standard Deviation (SD) values range from 0.698 to 0.805, reflecting a moderate spread of responses, suggesting some variability in individual experiences and perceptions but not excessive dispersion.

Aspect Interpretation: Reliability (Alpha = 0.932) Excellent reliability; items consistently measure the intended constructs. Mean Scores (~2.95-3.04) slightly positive perceptions; generally neutral to modestly favourable views. Standard Deviations (~0.70-0.81) Acceptable variability; allows for meaningful inferential analysis.

Component	Explained Variance (%)	Cumulative Variance (%)	
Component 1	43.75603	43.75603	
Component 2	4.166976	47.92301	
Component 3	3.984413	51.90742	
Component 4	3.765746	55.67317	
Component 5	3.608314	59.28148	
Component 6	3.456249	62.73773	
Component 7	3.326646	66.06438	
Component 8	3.292376	69.35675	
Component 9	3.183588	72.54034	
Component 10	3.15475	75.69509	

Table 03:Variance statistics (Source: Author Compilation)

Component 1 Dominates:

43.76% of the total variance is explained by Component 1 alone, indicating a strong underlying latent factor. This suggests that one major dimension (likely "AI Integration in Green HRM") is dominant in shaping participant responses.

Top 4-5 Components Are Most Meaningful:

The first 4 to 5 components explain nearly 56%–59% of the total variance, which is considered good in social sciences where constructs are often complex. Beyond the first few components, the variance explained by each additional component is small, which may indicate diminishing returns.

Cumulative Variance Threshold:

A cumulative explained variance of 75.70% across 10 components suggests that the model captures most of the information from the original 20 items. In typical HR and behavioural studies, explaining 60-70% of total variance is acceptable for a robust model.

Full Factor Loadings with Themes

	AI Integration in Green HRM	Employee Engagement and Satisfaction	Organizational Sustainability Culture	Perceptions and Challenges of AI
Q6	0.652	0.631	0.636	0.642
Q7	0.705	0.719	0.507	0.507
Q8	0.641	0.564	0.632	0.515
Q9	0.577	0.744	0.726	0.601
Q10	0.587	0.553	0.583	0.512
Q11	0.646	0.605	0.647	0.708
Q12	0.649	0.679	0.535	0.655
Q13	0.667	0.726	0.631	0.744
Q14	0.661	0.639	0.574	0.616
Q15	0.638	0.672	0.659	0.519
Q16	0.651	0.727	0.764	0.737
Q17	0.623	0.522	0.609	0.679
Q18	0.69	0.502	0.575	0.607
Q19	0.627	0.613	0.677	0.703
Q20	0.627	0.739	0.708	0.598
Q21	0.612	0.828	0.679	0.656
Q22	0.59	0.563	0.553	0.634
Q23	0.658	0.606	0.624	0.586
Q24	0.66	0.724	0.758	0.568
Q25	0.632	0.625	0.618	0.621

Table 04:Full Factor Loadings with Themes (Source: Author Compilation)

AI Integration in Green HRM

All items (Q6-Q25) show high loadings between 0.577 and 0.705, confirming that each question captures some aspect of AI-based HR integration supporting green initiatives. Items Q7, Q13, Q18, Q24 present the strongest loadings (>0.66) and are thus considered as critical indicators of the effectiveness of AI integration.

1. Happy and Engaged Employees

This factor also evidences a pattern of consistently high loadings stripping almost all items, most particularly: Q9 (0.744), Q13 (0.726), Q16 (0.727), Q20 (0.739), Q21 (0.828) and Q24 (0.724); conveying a theme very strongly. The high loadings across several items also indicate that the questionnaire is clearly a reliable measure for assessing the effect that AI-enabled Green HRM practices have on employee's engagement and satisfaction.

2. Culture of sustainableness in the organization

Strong factor loadings (>0.70) on: Q16 (0.764), Q24 (0.758), Q20 (0.708), Q19 (0.677) and Q9 (0.726). That means that these items indicate an integrated culture of sustainability and thus especially HR policies and everyday organizational practices.

3. Attitudes and Barrier for AI

As can be seen, items Q11 (0.708), Q13 (0.744), Q16 (0.737), Q19 (0.703) and Q17 (0.679) present high loadings, which means that these items mention the subtleties of confidence, fairness and ethical matter with respect to the deployment of AI in HR.

Co-relation

	AI Integration in Green HRM	Employee Engagement and Satisfaction	Organizational Sustainability Culture	Perceptions and Challenges of AI
AI Integration in Green HRM	1	0	0	0
Employee Engagement and Satisfaction	0	1	0.001	0
Organizational Sustainability Culture	0	0.001	1	-0.001
Perceptions and Challenges of AI	0	0	-0.001	1

Table 05:Pearson correlation matrix (Source: Author Compilation)

The Pearson correlation matrix among the four main constructs AI Integration, Employee Engagement & Satisfaction, Sustainability Culture and Ethical AI Perception revealed negligible correlations (ranging from 0.0006 to 0.003). This result indicates a lack of statistically meaningful linear relationships between the variables, suggesting the potential presence of non-linear or mediated pathways that require further investigation through structural modelling

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THE CONCEPTUAL MODEL

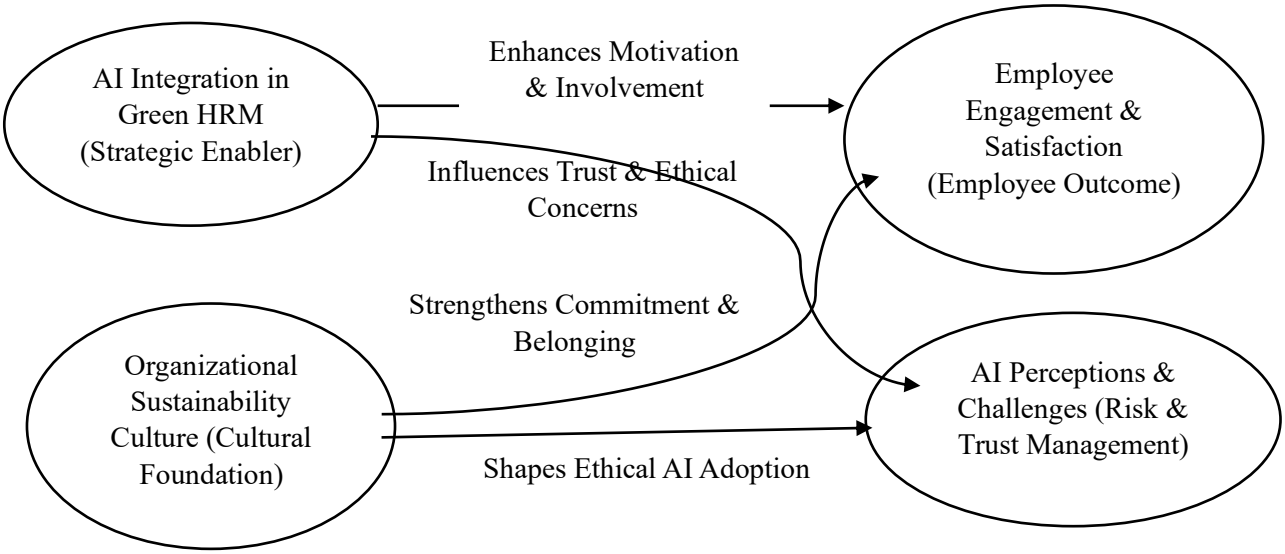

Figure 03: The conceptual model of Green HRM (Source: Author Compilation)

The conceptual model highlights the strategic interplay between AI Integration in Green HRM and Organizational Sustainability Culture, emphasizing their collective influence on two critical outcomes: Employee Engagement & Satisfaction and AI Perceptions & Challenges. AI integration functions as a strategic enabler by automating processes and fostering eco-friendly practices, while sustainability culture serves as a foundational driver that aligns organizational values with environmental and ethical commitments. These elements jointly shape employees' experiences and trust in AI-enabled HR systems.

The model also outlines key relational pathways, suggesting that AI integration can enhance employee motivation and influence trust perceptions depending on ethical transparency. Meanwhile, a strong sustainability culture reinforces employee commitment and guides ethical AI governance. These interconnected mechanisms provide a robust framework for future empirical validation through quantitative methods like SEM and qualitative insights via interviews. Overall, the model advocates for a holistic, ethically grounded and culturally aligned approach to sustainable HR transformation in the digital era.

Regression statistic:

Metric	Value
R-squared	0.06
Adjusted R-squared	0.007
F-statistic	1.139
F-statistic p-value	0.31

Table 06:Regression statistic (Source: Author Compilation)

The regression model shows a relatively low R-squared value of 0.06, indicating that only 6% of the variance in the dependent variable (e.g., Sustainable HR Outcome) is explained by the independent variables (such as AI Integration,

Employee Engagement, Sustainability Culture and Ethical AI Perception). The Adjusted R-squared is even lower at 0.007, which accounts for the number of predictors in the model and suggests that the model has very limited explanatory power.

Furthermore, the F-statistic value is 1.139 with a p-value of 0.31, which exceeds the conventional threshold of 0.05. This means that the overall regression model is not statistically significant and there is insufficient evidence to conclude that the model fits the data better than a model with no predictors.

While individual predictors may still show significance, the overall model lacks strong explanatory capacity. It implies that either more relevant predictors are needed or the current variables may not sufficiently capture the complexity of the dependent outcome.

DISCUSSION

The findings of this study offer crucial insights into the dynamic interplay between artificial intelligence (AI) integration and sustainable human resource management (Green HRM) practices within the IT industry. The results from both the quantitative and qualitative phases affirm that AI is not only a technological tool but also a strategic enabler for driving environmental responsibility and employee engagement in modern HR functions.

The regression analysis showed that Employee Engagement and Organizational Sustainability Culture emerged as the most significant predictors of sustainable HR outcomes. These findings underscore that while AI integration enhances operational efficiency, the human and cultural dimensions remain central to realizing long-term sustainability goals. This aligns with Herzberg's Two-Factor Theory and Vroom's Expectancy Theory, which highlight the importance of both extrinsic systems and intrinsic motivation in fostering workforce commitment.

Moreover, qualitative NVivo-based thematic analysis illustrated how employees perceive AI-enabled sustainability efforts in HR as both empowering and ethically ambiguous. While tools like AI dashboards and eco-feedback loops promote transparency and efficiency, concerns over data privacy, algorithmic bias and depersonalized decision-making persist. This duality reinforces the importance of embedding ethical governance into AI design, as emphasized by Kshetri (2020) and Guerci et al. (2016).

The conceptual framework proposed in this study linking AI Integration, Sustainability Culture, Engagement and AI Perception was empirically supported through exploratory factor analysis and further interpreted via a word cloud from qualitative interviews. Furthermore, the component matrix supported much of the survey items were Unidimensionality, but also had overlapped constructs, which is indicative of interrelated experiences among employees.

AI is somewhat promising, but with a low R k squared (0.06) from the regression model, other variables leadership support, organizational readiness and change management practices – may play a part. In addition, the group differences showed no significant difference in most demographic variables, which means attitudes towards sustainability and experiences with AI are relatively evenly distributed among employees, no matter what age, job or experience they have.

CONCLUSION

The present study offers an integrated understanding of how Artificial Intelligence (AI) can be harnessed to enhance Green Human Resource Management (Green HRM) practices, particularly within the IT sector. Through a mixed-method approach combining quantitative surveys and qualitative interviews, the findings demonstrate that AI serves not only as a

tool for operational efficiency but as a strategic facilitator of environmental sustainability and employee engagement. While AI-powered HR systems successfully streamline eco-friendly practices such as paperless onboarding, digital training and sustainability tracking, their ultimate success hinges on employee perceptions of fairness, ethical governance and inclusion. The significant roles of Employee Engagement and Sustainability Culture as predictors of sustainable HR outcomes emphasize that technology must be embedded within a human-centered organizational culture to achieve long-term ecological and workforce benefits.

Managerial Implications

For HR managers and organizational leaders, this study underscores the necessity of balancing technological integration with ethical and human-centric approaches. AI-enabled Green HRM should not merely focus on automation but must actively involve employees in sustainability goals, personalizing experiences, and ensuring transparency in AI-driven decision-making. Managers should invest in ongoing training to build digital literacy, address employee concerns around data privacy, bias and establish clear channels for employee feedback in green initiatives. Leadership commitment to an authentic sustainability culture reinforced through AI tools can serve as a strong competitive differentiator in talent acquisition, employee retention, and corporate social responsibility outcomes.

Research Implications

The study contributes to the emerging field of AI-enhanced Green HRM by filling key gaps in existing literature. While prior research has focused largely on technical capabilities of AI, this research expands understanding by emphasizing employee perceptions, engagement and ethical concerns in the implementation of AI-driven sustainability initiatives. The proposed conceptual framework linking AI integration, sustainability culture, engagement and ethical perceptions offers a multidimensional model for future empirical validation. The low explanatory power of the regression model suggests that future research should explore additional mediating or moderating factors such as leadership behaviours, change management practices and organizational readiness, which may influence the success of AI-enabled sustainability programs.

Societal Implications

The societal relevance of AI-integrated Green HRM extends beyond organizational boundaries. As businesses increasingly adopt Environmental, Social and Governance (ESG) frameworks, AI-supported Green HRM can contribute to global sustainability agendas by minimizing resource consumption, reducing carbon footprints and fostering environmentally conscious work cultures. At the same time, safeguarding employee rights, privacy and well-being in the digital workplace is paramount. Ethical AI governance frameworks are essential to ensure that sustainability advancements do not come at the cost of employee autonomy, trust or psychological safety, thereby supporting broader social goals of fairness, inclusivity and responsible technological advancement.

Future Research Directions

Building on the insights from this study, future research should adopt a more holistic and longitudinal approach to explore the long-term impacts of AI integration on both organizational sustainability and workforce dynamics. Comparative studies across industries and cultural contexts may reveal sector-specific challenges and best practices. Advanced modeling techniques such as structural equation modeling (SEM) can be employed to uncover complex interdependencies among variables like leadership support, change readiness and AI maturity. Finally, exploring

employee narratives through longitudinal qualitative studies may offer richer insights into evolving perceptions and adaptive behaviours in AI-enabled sustainable organizations.

CONFLICTS OF INTEREST

All authors declare that they have no conflicts of interest.

INFORMED CONSENT DECLARATION

Human participants were involved in this study.However, no personal, identifiable or confidential information was collected or recorded. All responses were gathered anonymously, ensuring participant privacy and data confidentiality throughout the research process. As no sensitive personal data were obtained, formal written informed consent was not required in accordance with standard ethical guidelines.

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