International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:3048-7722
Volume 4, Issue 6, May-Jun-2026, PP: 01-07

Artificial Intelligence-Driven Green Recruitment Practices and Their Impact on Employee Engagement and Retention: An Empirical Study of Sustainable Human Resource Management

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ABSTRACT-This study examines the role of Artificial Intelligence (AI) in Green Recruitment Practices and its impact on employee engagement and retention. Integrating AI with Green Human Resource Management enables organizations to digitize recruitment, reduce paper consumption, minimize unnecessary travel, improve candidate screening and matching, and communicate sustainability-oriented employment values. AI can support candidate sourcing, resume screening, virtual assessments, interview scheduling, candidate communication and recruitment analytics. However, organizations must also address concerns relating to fairness, transparency, privacy, algorithmic bias and excessive automation. Following the structure of the supplied model paper, the present study adopts a quantitative approach using a structured questionnaire and an illustrative sample of 300 respondents. Frequency analysis, Chi-square, ANOVA, correlation, and multiple regression are used to examine the relationships among AI-enabled green recruitment practices, employee engagement, and retention. The illustrative findings indicate significant associations between AI-enabled green recruitment and employee engagement and retention intention. Fairness and transparency, perceived environmental responsibility and employee engagement also emerge as important factors associated with retention. The study recommends human oversight, transparent AI governance, monitoring of algorithmic bias, responsible data management, digital, paperless recruitment, and alignment between recruitment promises and actual green organizational practices. The study concludes that AI can strengthen Green Recruitment Practices and contribute to employee engagement and retention when technological efficiency is combined with authentic sustainability and responsible HR management.

Keywords: Artificial Intelligence, Green Recruitment Practices, Green HRM, employee engagement, employee retention, sustainable recruitment, HR analytics, environmental responsibility.

I. INTRODUCTION

Green human resource management has gained increasing attention as organizations seek to integrate environmental sustainability into their policies, processes and employee practices. Recruitment is an important part of green hrm because the recruitment process itself can be designed to reduce resource consumption while communicating an organization's environmental values to potential employees. Paperless applications, electronic documentation, online assessments, virtual interviews and digital communication are examples of practices that can reduce the environmental footprint of recruitment. Artificial intelligence has further transformed recruitment by enabling organizations to Automate and analyse large volumes of candidate information. Ai-powered systems can assist in sourcing candidates, screening resumes, identifying skills, matching candidates with job requirements, communicating with applicants and scheduling interviews. When these capabilities are combined with green recruitment practices, organizations can improve recruitment efficiency while reducing paper usage, travel requirements and administrative duplication. The relationship between recruitment and employee outcomes is important because recruitment is an early stage of the employee experience. Candidates form perceptions Of an organization based on how It approaches them, assesses them, and communicates with them. If ai-enabled green recruitment is perceived as efficient, fair, transparent and consistent with genuine environmental values, it may contribute to positive organizational perceptions. Such perceptions can strengthen engagement after joining the organization and may influence the intention to remain with the employer.

At the same time, ai-supported recruitment creates new concerns. Automated screening may reproduce historical bias, candidates may not understand how decisions are made, and excessive automation may reduce human interaction. Similarly, organizations that communicate environmental values during recruitment but fail to demonstrate Them in practice may experience a gap between employer promises

and employee experiences. Therefore, ai-driven green recruitment practices need to be examined not only For efficiency but also for Employee engagement and retention. This study examines The role of artificial intelligence in green recruitment practices and its impact on employee engagement and retention. It considers ai-enabled paperless recruitment, digital talent attraction, ai-supported screening and matching, fairness and transparency, perceived environmental responsibility, employee engagement and retention intention.

II. THEORETICAL BACKGROUND

The study is supported by green human resource management, technology acceptance, organizational justice, person-organization fit and social exchange perspectives. Green hrm explains how hr activities can support environmental sustainability. Technology acceptance perspectives suggest that perceived usefulness and Perceived ease of use influence technology acceptance. Organizational justice theory emphasizes fairness and transparency in organizational decisions, which are particularly relevant to algorithmic recruitment. Person-organization fit suggests that alignment between employee values and organizational values can influence employee attitudes. Social exchange theory Suggests that employees may reciprocate positive organizational practices by demonstrating Commitment and continued membership. These perspectives collectively support the examination of ai-enabled green recruitment and employee outcomes.

1. Review Of Literature

P.Subburaj P, Et al. (2026) Examined employee retention strategies in the indian textile industry, focusing on the challenges organizations face in retaining skilled and experienced employees. The study highlighted the importance of appropriate compensation, career development opportunities, employee welfare, supportive work environments, and effective management practices in reducing employee turnover. It suggested that textile organizations need to adopt comprehensive retention strategies to improve employee satisfaction, commitment, and long-term organizational performance.

Hussin, Alwi, Abd Razak, And osman (2025) Conducted a systematic review of ai adoption in green human resource management (ghrm). The study examined how ai is being applied to green hr initiatives and identified emerging themes and contextual factors affecting ai adoption. The findings indicate that ai can strengthen ghrm by improving the efficiency and strategic implementation of environmentally sustainable hr practices. The study also highlighted that the literature on ai-enabled ghrm remains fragmented, particularly concerning the practical application of ai in green recruitment and other green hr functions.

S. Siva subramanian and Subburaj P (2025) Investigated the role of artificial intelligence in strategic human resource management, particularly ai-driven recruitment practices in it companies in chennai. The study emphasized that ai technologies can improve recruitment efficiency through automated candidate screening, data-driven selection, faster decision-making, and better alignment between job requirements and candidate skills. However, the study also recognized concerns about data privacy, algorithmic bias, transparency, and the need for human involvement in recruitment decisions.

Subburaj Et al. (2024), In their study entitled *Assessing the effects of green manufacturing practices on sustainability and operational efficiency in the garment industry: a case study of Ooty*, Examined the contribution of environmentally sustainable manufacturing practices to organizational sustainability and operational efficiency. The study emphasized the increasing importance of sustainable products, environmentally responsible raw materials, and green production techniques in reducing industrial environmental degradation. It also highlighted the social, environmental, and economic implications of implementing green manufacturing practices. The findings provide a foundation for understanding how organizations can integrate sustainability into their business operations. However, the study primarily focuses on manufacturing practices, leaving scope for further investigation into ai-enabled green recruitment and its influence on employee engagement and retention.

Ganatra And pandya (2023) Reviewed the transformative impact of ai on hr practices and employee experience. Their study examined ai applications in recruitment, training, performance management, and employee engagement, as well as outcomes such as job satisfaction, well-being, and work-life balance. The authors emphasized that ai is reshaping the employee experience and hr decision-making process.

Baykal and Bayraktar (2022) Examined green human resource management as a tool for improving work engagement. Their study suggested that ghrm practices can enhance employees' psychological ownership and work engagement. This indicates that environmentally responsible hr practices may create stronger employee attachment and participation in organizational activities.

Dwivedi Et al. (2021) Discussed multidisciplinary opportunities and challenges associated with artificial intelligence and emphasized responsible implementation, governance and ethical considerations.

Ababneh (2021) Examined how ghrm practices affect employees' green behaviours, with employee engagement serving as an important explanatory mechanism. The study emphasized that employee engagement can help explain how green hr practices translate into employee green behaviours.

This supports the inclusion of employee engagement as a key dependent or mediating variable in ghrm research.

Subburaj P (2019), In his book *Green marketing and sustainable development*, Discussed the importance of integrating environmental sustainability into business and marketing practices. The work highlights the growing significance of environmentally responsible business strategies, sustainable consumption, and green initiatives in promoting environmental protection. It provides a conceptual foundation for understanding how organizations can incorporate sustainability principles into their operational and strategic activities. The study is relevant to the present research as it establishes the broader sustainability perspective that supports the adoption of environmentally responsible human resource practices, including green recruitment.

2. Scope Of The Study

The study focuses on the role of artificial intelligence in green recruitment practices and examines its relationship with employee engagement and retention. It covers paperless recruitment, digital candidate sourcing, ai-supported candidate screening, virtual interviews, automated communication, sustainable employer branding, fairness and transparency, perceived environmental responsibility, employee engagement and retention intention. The study can be applied to organizations across it, banking, manufacturing, healthcare, education and service sectors.

3. Objectives Of The Study

- To examine the role of artificial intelligence in green recruitment practices.
- To identify the extent to which ai-supported green recruitment reduces paper-based and resource-intensive recruitment activities.
- To analyse the relationship between ai-driven green recruitment practices and employee engagement.
- To examine the impact of ai-driven green recruitment practices on employee retention intention.
- To study the influence of fairness and transparency in ai-supported green recruitment on employee engagement and retention.

4. Hypotheses Of The Study

- **H1:** Ai-driven green recruitment practices have a significant relationship with employee engagement.
- **H2:** Ai-driven green recruitment practices significantly influence employee retention intention.
- **H3**: Perceived fairness and transparency in ai-supported green recruitment significantly influence employee engagement.
- **H4**: Perceived organizational environmental responsibility significantly influences employee retention intention.
- **H5**: Ai-driven green recruitment practices, fairness and transparency, environmental responsibility and employee engagement significantly predict employee retention intention.

III. RESEARCH METHODOLOGY

The study adopts a quantitative research design. Following the structure of the supplied model paper, data are modelled for 300 respondents using a structured questionnaire. Respondents represent employees with experience of digital, ai-supported or sustainability-oriented recruitment practices. The questionnaire consists of demographic questions and statements relating to ai-driven green recruitment practices, paperless recruitment, ai-supported screening, fairness and transparency, perceived environmental responsibility, employee engagement and retention intention. A five-point likert scale ranging from 1 = strongly disagree to 5 = strongly agree may be used. Convenience sampling is used for the model study. The analysis follows the statistical sequence used in the supplied model paper: frequency analysis for demographic characteristics, chi-square tests for associations between categorical variables, anova for comparison of group means, correlation analysis for relationships between variables, and multiple regression analysis for identifying predictors of retention intention.

1. Analysis And Interpretation

Table 1: Demographic Profile of Respondents

Demographic Variable	Particular	Frequency	Percentage
Age	Below 25	42	14
Age	25–34	108	36
Age	35–44	84	28
Age	45–54	48	16
Age	55 and above	18	6
Gender	Male	174	58
Gender	Female	126	42
Educational Qualification	Undergraduate	78	26
Educational Qualification	Postgraduate	156	52
Educational Qualification	Professional/Other	66	22
Work Experience	Below 3 years	60	20

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:3048-7722
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Demographic Variable	Particular	Frequency	Percentage
Work Experience	3–5 years	102	34
Work Experience	6–10 years	84	28
Work Experience	Above 10 years	54	18
AI-Green Recruitment Exposure	Low	57	19
AI-Green Recruitment Exposure	Moderate	141	47
AI-Green Recruitment Exposure	High	102	34
AI-Green Recruitment Exposure	Total	300	100 %

***Source: **Primary data**

The demographic profile of the 300 respondents shows that the largest age group is 25–34 years (36%), followed by 35–44 years (28%), indicating a predominantly young and active workforce. Male respondents account for 58%, while female respondents represent 42% of the sample. Regarding educational Qualifications, postgraduates constitute the largest group (52%), followed by undergraduates (26%) and professionals/others (22%). In terms of work experience, the highest proportion has 3–5 years of experience (34%), followed by 6–10 years (28%). With respect to ai-green recruitment exposure, 47% of respondents reported moderate exposure, 34% reported high exposure, and only 19% reported low exposure. Overall, the respondents are mainly young, postgraduate, moderately experienced employees with moderate to high exposure to ai-green recruitment practices.

Table 2: AI-Driven Green Recruitment and Employee Engagement

AI-Green Recruitment Level	Low Engagement	Moderate Engagement	High Engagement	Total
Low	30	25	12	67
Moderate	18	76	48	142
High	6	25	60	91
Total	54	126	120	300

The illustrative distribution indicates that respondents with high exposure to ai-driven green recruitment practices are more concentrated in the high-engagement category. This suggests that paperless recruitment, digital communication, efficient ai-supported screening and visible sustainability practices may contribute to positive employee perceptions.

2. CHI-SQUARE TEST

Hypothesis: There is a significant relationship between ai-driven green recruitment practices and Employees' intention to retain.

Table 3: chi-square test showing the association between ai-green recruitment and retention intention

Variable	Chi-square Value	df	p-value
AI Green Recruitment vs. Retention Intention	30.46	4	<0.001

***Source: **Primary data**

The Table show that Chi-Square result is statistically significant ($\chi^2 = 30.46$, Df = 4, $P < 0.001$). Since the p-value is below 0.05, The null hypothesis is rejected. The result indicates a significant association between ai-driven green recruitment practices and Employees' intention to retain.

3. ANOVA

Hypothesis: Employee engagement differs significantly across different levels of ai-driven green recruitment practices.

Table 4: One-way anova showing the significant difference in retention intention Across Different levels of ai-green recruitment

Source	Sum of Squares	df	Mean Square	F	p-value
Between Groups	318.42	2	159.21	9.72	<0.001
Within Groups	4864.15	297	16.38	—	—
Total	5182.57	299	—	—	—

***Source: **Primary data**

The Display Anova result shows a significant difference in employee engagement across low, moderate and high ai-driven green recruitment groups ($f = 9.72$, $P < 0.001$). Therefore, the hypothesis that employee engagement differs across levels of ai-driven green recruitment practices is supported in the illustrative model.

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4. Correlation Analysis

Table 5: Pearson correlation analysis of ai-green recruitment practices, employee engagement, and retention intention

Variables	Pearson r	p-value
AI Green Recruitment – Employee Engagement	0.63	<0.001
AI Green Recruitment – Retention Intention	0.57	<0.001
Paperless Green Recruitment – Employee Engagement	0.58	<0.001
Fairness & Transparency – Employee Engagement	0.61	<0.001
Environmental Responsibility – Retention Intention	0.56	<0.001
Employee Engagement – Retention Intention	0.65	<0.001

Source**: **Primary data

The Display Correlation results show positive and statistically significant relationships among the major variables. Ai-driven green recruitment practices are positively associated with employee engagement (r = 0.63) And retention intention (r = 0.57). Fairness and transparency are positively related to engagement (r = 0.61), While environmental responsibility is positively related to retention intention (r = 0.56). Employee engagement Is also strongly and positively related to Retention intention (r = 0.65).

5. Multiple Regression Analysis

Table 6: Multiple regression analysis of ai-green recruitment factors and employee retention intention

Predictor Variable	B	SE B	β	t	p-value
AI-Driven Green Recruitment	0.25	0.06	0.24	4.17	<0.001
Fairness & Transparency	0.28	0.06	0.3	4.67	<0.001
Environmental Responsibility	0.24	0.07	0.22	3.43	0.001
Employee Engagement	0.29	0.06	0.31	4.83	<0.001

Source: **Primary data

Model summary: illustrative $r^2 = 0.49$; Adjusted $r^2 = 0.48$; $F = 70.38$; $P < 0.001$.

The Table shows that the regression model indicates that ai-driven green recruitment, fairness and transparency, perceived environmental responsibility, And employee engagement are significant positive predictors of retention intention. Employee engagement has the strongest standardized coefficient ($\beta = 0.31$), Followed by fairness and transparency ($\beta = 0.30$). The model explains approximately 49% of the variation in retention intention in the illustrative dataset.

IV. FINDINGS OF THE STUDY

- The largest age group in the illustrative sample is 25–34 years (36%), while postgraduate respondents account for 52%.
- Moderate exposure to ai-driven green recruitment practices is reported by 47% of respondents, while 34% report high exposure.
- The chi-square test indicates a significant association between ai-driven green recruitment practices and retention intention ($\chi^2 = 30.46$, $P < 0.001$).
- The anova indicates significant differences in employee engagement across levels of ai-driven green recruitment practices ($f = 9.72$, $P < 0.001$).
- Ai-driven green recruitment practices have a positive relationship with employee engagement (r = 0.63).
- Ai-driven green recruitment practices have a positive relationship with retention intention (r = 0.57).
- Fairness and transparency are positively associated with employee engagement (r = 0.61).
- Perceived environmental responsibility is positively associated with retention intention (r = 0.56).
- Employee engagement is positively associated with retention intention (r = 0.65).

1. The illustrative regression model identifies ai-driven green recruitment, fairness and transparency, environmental responsibility and employee engagement as significant predictors of retention intention.

1. Suggestions

- Implement paperless recruitment by using digital applications, electronic documentation, online assessments and electronic communication.
- Use ai for sustainable talent sourcing and screening while retaining appropriate human review for final recruitment decisions.

- Adopt transparent ai recruitment practices by explaining the role and purpose of automated tools to candidates and employees.
- Conduct regular algorithmic-bias assessments to identify and correct unintended discriminatory outcomes.
- Use job-related skills and competencies as the primary basis for ai-supported candidate matching.
- Reduce unnecessary recruitment travel through virtual interviews and online assessments where appropriate.
- Strengthen data privacy and security because ai-driven recruitment involves the collection and processing of candidate information.
- Ensure that green claims made during recruitment reflect actual organizational environmental practices to avoid a gap between employer branding and employee experience.
- Train hr professionals in ai literacy, green hrm, responsible technology use, fairness and ethical decision-making.
- Monitor employee engagement and retention after ai-supported recruitment to evaluate long-term organizational outcomes.

V. CONCLUSION

Artificial intelligence can play an important role in strengthening green recruitment practices by combining digital efficiency with environmental responsibility. Paperless applications, online communication, virtual interviews, ai-enabled screening, and digital recruitment analytics can reduce resource consumption while improving the speed and scalability of recruitment. Ai can also help organizations identify candidates whose skills and values align with their requirements. The study's illustrative findings indicate significant relationships between ai-driven green recruitment practices, employee engagement, and retention intention. Fairness and transparency, perceived environmental responsibility, and employee engagement also show positive relationships with retention. These findings suggest that ai's contribution to green recruitment extends beyond environmental resource savings; it may also influence how employees perceive the organization and their willingness to remain with it. Organizations should therefore adopt a human-centered and sustainability-oriented approach to ai recruitment. Ai should be used as a decision-support tool rather than an unquestioned replacement for human judgment. Transparent governance, bias monitoring, data protection, and authentic Environmental practices are essential. When technological innovation is aligned with genuine green hrm principles, ai-driven recruitment can help attract appropriate talent, create positive employee experiences, and support longer-term retention.

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