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Artificial Intelligence Integration in Strategic Human Resource Management: An Empirical Investigation of Human-Centric Sustainability Perceptions in the Industry 5.0 Era

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Abstract

The advent of Industry 5.0 signals a decisive reorientation of industrial strategy toward human-centricity, sustainability, and technological symbiosis. Within this paradigm, the strategic integration of Artificial Intelligence (AI) into Human Resource Management (HRM) has emerged as a pivotal organisational imperative. The present study empirically investigates how AI-enabled HRM practices shape employee perceptions of organisational sustainability, with particular emphasis on whether the capacity to balance automation with human-centric values is associated with sustainability outcomes. Grounded in a quantitative research design, primary data were gathered from 76 respondents drawn from the information technology sector in Mysuru, India, using a structured Likert-scale questionnaire (Cronbach's $\alpha = 0.942$). The study's central hypothesis posits a significant positive association between employees' perceptions of AI's automation-human balance and their assessments of organisational sustainability. Pearson correlation analysis confirmed this relationship ($r = 0.464$, $p<0.01$). Supplementary analyses further reveal that professional role significantly moderates perceptions of human-centric AI alignment ($\chi^2 = 56.105$, $p<0.001$), while demographic variables such as age, gender, and tenure exert no statistically significant influence. The findings contribute an empirical foundation to the emerging discourse on AI-enabled SHRM within the Industry 5.0 framework and carry actionable implications for HR policy, ethical AI governance, and sustainable workforce strategy.

Keywords: Artificial Intelligence, Empirical Study, Human-Centric Values, Industry 5.0, Organisational Sustainability, Strategic Human Resource Management

JEL Classification Code: M12, M15, O33, D23, Q01

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1. Introduction

The global industrial landscape is undergoing a fundamental transformation driven by the convergence of advanced digital technologies and renewed emphasis on human welfare. Designated Industry 5.0 by the European Commission (2021), this paradigm extends beyond the automation-centric logic of its predecessor to foreground three interlocking pillars: human-centricity, sustainability, and organisational resilience. Unlike Industry 4.0, which was largely defined by the replacement of human labour with intelligent machines, Industry 5.0 envisions a collaborative ecosystem in which humans and machines act as complementary rather than competing agents in the production and management of value.

Within this evolving context, Strategic Human Resource Management (SHRM) occupies a uniquely critical position. The function of HR is no longer confined to administrative operations; it increasingly serves as the strategic interface through which organisations translate technological capability into human capital value. The integration of AI into SHRM, spanning talent acquisition, workforce analytics, performance management, and employee engagement, has accelerated markedly, enabling data-driven decision-making at a scale and precision previously unattainable. Yet the strategic value of AI in HRM extends beyond operational efficiency: it raises foundational questions about fairness, transparency, autonomy, and the preservation of human dignity within algorithmically mediated workplaces.

Despite a growing body of literature on AI in HRM, significant empirical lacunae persist, particularly with respect to how employees at various organisational levels perceive the balance between AI-driven automation and human-centric values, and whether such perceptions bear measurable associations with sustainability outcomes. This gap is especially pronounced in the context of emerging economies, where the rapid diffusion of AI-enabled HR tools has outpaced empirically grounded understanding of their human impacts.

The present study is designed to address this gap by empirically examining employee perceptions of AI integration in HRM within the IT sector of Mysuru, India, a region representative of India's thriving technology ecosystem. Specifically, the study investigates whether the perceived capacity of AI systems to balance automation with human-centric values is significantly associated with perceptions of organisational sustainability. In doing so, it contributes to both the theoretical and practical discourse on responsible AI deployment within the Industry 5.0 framework.

2. Review of Literature

The scholarly literature on AI in HRM has expanded considerably over the past decade, coalescing around three broad themes: technological capability and HR outcomes, employee experience and acceptance, and ethical and sustainability dimensions of AI deployment.

2.1 AI Capabilities and Strategic HR Outcomes

Rodriguez *et al.* (2024) advanced predictive modelling in strategic HRM, reporting 89% accuracy in turnover prediction using machine

learning applied to a dataset of 100,000 employee records, thereby demonstrating AI's potential to transform workforce retention strategies. Complementing this, Johnson *et al.* (2024) conducted a mixed-methods study involving 500 HR professionals, finding a 76% improvement in workforce planning accuracy attributable to AI-enabled forecasting tools. These studies collectively underscore AI's transformative effect on the analytical infrastructure of HR functions, enabling a shift from reactive to proactive talent management.

2.2 Employee Acceptance and Cross-cultural Dynamics

Chen *et al.* (2024) conducted a cross-cultural quantitative survey across 1,200 employees in eight countries, revealing that cultural background, age, and educational attainment are significant moderators of AI adoption attitudes in HR contexts. Their findings affirm that technology acceptance is not uniform and must be contextualised within socio-cultural frameworks. Ahmed and Singh (2024) extended this line of inquiry through a two-year action research intervention across five organisations, demonstrating a 45% improvement in learning effectiveness when AI-driven personalised training platforms were deployed in conjunction with human mentorship.

2.3 Sustainability, Ethics and Industry 5.0 Alignment

Brown *et al.* (2024) executed a mixed-methods study across 300 organisations, establishing that AI integration in HRM is positively associated with environmental impact reduction and social sustainability metrics when governed by transparent and inclusive deployment frameworks. The European Commission (2024) articulated regulatory principles for human-centric AI across 27 EU member states, emphasising that the governance of AI in workplaces must centre on dignity, non-discrimination, and ecological responsibility. The World Bank (2024) provided a complementary global perspective, projecting significant skills displacement across 180 countries and advocating for proactive policy intervention to ensure equitable workforce transition.

While these studies illuminate specific dimensions of AI's impact on HRM, they reveal a persistent gap: few empirical studies have examined the direct relationship between employees' perceptions of AI's human-centricity and their assessments of organisational sustainability, particularly within the Indian IT sector. The present study is positioned to address this lacuna.

3. Research Gap

Notwithstanding the volume and diversity of existing research, three substantive gaps merit attention. First, the majority of extant studies have been conducted in Western or East Asian organisational contexts, limiting the generalisability of their findings to emerging economy settings such as India, where AI adoption in HR is both rapid and unevenly distributed. Second, while macro-level analyses have associated AI with improved sustainability metrics at the organisational or sectoral level, micro-level empirical evidence linking individual employee perceptions of AI's human-centric orientation to sustainability

outcomes remains sparse. Third, the theoretical integration of Industry 5.0 principles, specifically human-machine collaboration, resilience, and sustainability, into SHRM research frameworks is still nascent, and few studies have operationalised these constructs in quantitatively testable hypotheses.

The present study is specifically designed to address these gaps by focusing on employee perceptions within the Mysuru IT sector, operationalising human-centricity and sustainability as measurable constructs, and situating the analysis within the Industry 5.0 framework.

4. Significance of the Study

The study's significance operates at three interrelated levels. Academically, it advances an empirically grounded understanding of the relationship between human-centric AI deployment and sustainability perceptions, contributing to the theoretical integration of Industry 5.0 principles into SHRM scholarship. Practically, the findings provide HR practitioners and organisational leaders with actionable evidence regarding the conditions under which AI integration fosters sustainable workforce outcomes, thereby informing ethical AI governance frameworks and HR technology adoption strategies. From a policy perspective, the study supports the development of regulatory guidelines that promote responsible AI deployment in Indian IT organisations, aligning with broader national and international commitments to equitable and sustainable technological development.

5. Research Hypothesis

In accordance with the theoretical framework and identified research gap, the following directional hypothesis, grounded in the sustainable human-centric AI paradigm of Industry 5.0, is advanced for empirical investigation:

H_0: There is no significant association between employees' perceptions of AI's capacity to balance automation with human-centric values and their perceptions of AI-driven improvements in organisational sustainability.

H_1: Employees' perceptions of AI's capacity to balance automation with human-centric values are significantly and positively associated with their perceptions of AI-driven improvements in organisational sustainability.

This hypothesis is theoretically anchored in the Industry 5.0 proposition that the complementarity of human agency and machine intelligence is a prerequisite for achieving sustainable organisational outcomes. A significant positive association would affirm that employees who perceive AI systems as respectful of human values are also more likely to attribute sustainability improvements to AI-enabled HRM, thus validating the human-centric design imperative articulated in the Industry 5.0 policy framework.

A supporting sub-hypothesis is also examined to enrich the analytical context:

SH_1: Professional role significantly moderates employee perceptions of AI's capacity to balance automation with human-centric values in the workplace.

6. Objectives of the Study

The study is guided by the following objectives:

(i) To empirically examine the association between employee perceptions of AI's automation-human balance and perceptions of organisational sustainability.

(ii) To assess whether professional role moderates perceptions of AI's human-centric orientation in the workplace.

(iii) To explore the influence of demographic variables (age, gender, and years of experience) on perceptions of AI in HRM, providing contextual depth to the primary hypothesis.

(iv) To map the interrelationships among key AI-HRM constructs Employee Experience and Wellbeing (EEWF), Talent Acquisition and Management (TAMF), Strategic Workforce Planning (SWPF), Implementation and Ethics (IEF), Organisational Impact (OIF), and Industry 5.0 Alignment (I5AF) to illuminate the structural coherence of AI-enabled SHRM in the Industry 5.0 context.

7. Research Methodology

7.1 Research Design

A cross-sectional quantitative research design was adopted, enabling the systematic examination of relationships between theoretically specified constructs at a single point in time. Quantitative methodology was selected for its capacity to generate generalisable, statistically testable findings regarding employee perceptions, a priority given the study's aim of producing empirical evidence suitable for theory-building in the AI-SHRM-Industry 5.0 intersection.

7.2 Population and Sampling

The target population comprised employees across diverse age cohorts, genders, professional roles, industry sectors, and organisational sizes operating within Mysuru, India. A stratified random sampling procedure was employed to ensure proportional representation across demographic and professional strata. The final analysable sample comprised 76 respondents, drawn from organisations spanning the IT, services, healthcare, and manufacturing sectors. Stratification was applied across gender, professional role, and organisational size to mitigate systematic sampling bias.

7.3 Instrumentation

Data were collected via a structured, self-administered questionnaire comprising 20 items distributed across six thematic dimensions: (i) Employee Experience and Wellbeing, (ii) Talent Acquisition and Management, (iii) Strategic Workforce Planning, (iv) Implementation and Ethics, (v) Organisational Impact, and (vi) Industry 5.0 Alignment. All items were measured on a five-point Likert scale anchored at "Strongly Disagree" (1) and "Strongly Agree" (5). Secondary data were drawn from extant literature on AI in HRM, including peer-reviewed journal articles, policy documents, and organisational case studies.

7.4 Reliability Assessment

Internal consistency of the instrument was evaluated using Cronbach's Alpha. The obtained coefficient ($\alpha = 0.942$) across all 20 items denotes

exceptional scale reliability, well exceeding the conventional threshold of 0.70 (Nunnally, 1978), and affirms that the questionnaire items consistently measure the underlying constructs of interest.

Table 1. Reliability statistics

Cronbach's Alpha	No. of Items
0.942	20

7.5 Data Analysis

Data were analysed using SPSS. Reliability Analysis was checked at 0.942 as per Table 1. The analytical strategy proceeded in two stages. First, descriptive statistics characterised the sample profile. Second, inferential statistics, including Pearson correlation analysis, one-way ANOVA, independent samples t-tests, and chi-square tests, were employed to test the hypotheses. The central hypothesis (H_1) was evaluated via Pearson correlation between the composite scores for "Balance automation with human-centric values" and "AI in HR improves Organisational Sustainability." The supporting sub-hypothesis (SH_1) was assessed via a chi-square test of independence between professional role and human-centric values perception.

8. Sample Profile

Table 2 presents the demographic characteristics of the 76 respondents. The sample is dominated by young professionals: 61.8% are aged 21-30 years, reflecting the age composition typical of the Indian IT sector. A modest male majority is observed (57.9% male,

Table 2. Demographic Profile of Respondents (N = 76)

Variable	Category	Frequency	Percentage
Age	21-30 years	47	61.8%
	31-40 years	13	17.1%
	41-50 years	15	19.7%
	>50 years	1	1.3%
Gender	Male	44	57.9%
	Female	32	42.1%
Professional Role	HR Professional/Manager	12	15.8%
	Senior Management	6	7.9%
	Employee	47	61.8%
	Other	11	14.5%
Experience	>5 years	44	57.9%
	2-5 years (various bands)	32	42.1%
Sector	Technology	23	30.3%

Table 2 Continued

	Services	22	28.9%
	Healthcare	7	9.2%
	Manufacturing	4	5.3%
	Others	20	26.3%
Organisation size	<100 employees	16	21.1%
	101-500 employees	13	17.1%
	501-1,000 employees	6	7.9%
	>1,000 employees	41	53.9%

42.1% female). The majority of respondents are general employees (61.8%), with HR professionals/managers (15.8%) and senior management (7.9%) comprising smaller but analytically meaningful sub-groups. Over half of respondents (57.9%) report more than five years of professional experience. In terms of sector, technology (30.3%) and services (28.9%) are the most represented. Organisationally, 53.9% of respondents are employed in large organisations (>1,000 employees), providing a perspective weighted toward enterprise-scale AI deployment.

9. Data Analysis and Results

9.1 Inter-construct Correlation Matrix

To establish the structural coherence of the AI-HRM measurement framework, Pearson

Table 3. Inter-construct Pearson Correlation Matrix (N = 76)

Variable	EEWF	TAMF	SWPF	IEF	OIF	I5AF
EEWF	1	0.683**	0.740**	0.543**	0.838**	0.728**
TAMF	0.683**	1	0.771**	0.436**	0.669**	0.600**
SWPF	0.740**	0.771**	1	0.560**	0.762**	0.708**
IEF	0.543**	0.436**	0.560**	1	0.601**	0.634**
OIF	0.838**	0.669**	0.762**	0.601**	1	0.810**
I5AF	0.728**	0.600**	0.708**	0.634**	0.810**	1

** Correlation significant at the 0.01 level (2-tailed). EEWF = Employee Experience and Wellbeing; TAMF = Talent Acquisition and Management; SWPF = Strategic Workforce Planning; IEF = Implementation and Ethics; OIF = Organisational Impact; I5AF = Industry 5.0 Alignment

correlation analysis was conducted across all six thematic constructs. As shown in Table 3, all inter-construct correlations are positive and statistically significant at the 0.01 level, with coefficients ranging from 0.436 (IEF-TAMF) to 0.838 (OIF-EEWF). The strong correlation between Organisational Impact (OIF) and Employee Experience (EEWF) (r = 0.838), and between OIF and Industry 5.0 Alignment (I5AF) (r = 0.810), affirms that AI's organisational impact is deeply intertwined with both employee-level experience and strategic sustainability alignment, a finding that is theoretically consonant with the Industry 5.0 framework. The null hypothesis of no significant relationship among the constructs is thus rejected across all pairs.

9.2 Test of the Primary Hypothesis: AI Human-Centric Balance and Organisational Sustainability

The primary hypothesis (H_1) posits a significant positive association between employees' perceptions of AI's capacity to balance automation with human-centric values and their perceptions of AI-driven improvements in organisational sustainability. Pearson correlation analysis was applied to these two composite variables.

The Pearson correlation coefficient (r = 0.464, p<0.01), as indicated in Table 4, shows a statistically significant moderate positive association between the two constructs. The null hypothesis (H_0) is therefore rejected. This finding supports H_1: employees who perceive AI systems as effectively balancing automation with human-centric values are significantly more likely to attribute improvements in organisational sustainability to AI-enabled HR practices. In the Industry 5.0 context, this result is substantively meaningful, as it empirically validates the proposition that the design and governance of AI systems to respect human values constitutes a prerequisite for achieving sustainable organisational outcomes, rather than a supplementary consideration.

9.3 Test of the Supporting Sub-hypothesis: Professional Role and Human-centric Perceptions

The chi-square test of independence was applied to assess whether professional role significantly moderates perceptions of AI's automation-human balance (SH_1).

The chi-square test as indicated in Table 5 yields a highly significant result for professional

Table 4. Pearson Correlation - Automation-human balance vs. organisational sustainability

Variable Pair	Pearson r	N	pvalue	Decision
Balance automation vs. organisational sustainability	0.464	76	0.000 (<0.01)	Reject H_0

** Significant at the 0.01 level (2-tailed)

Table 5. Chi-Square Test - professional role × automation-human balance

Variable	χ^2 statistic	df	pvalue	Expected cell freq. ≥5	Decision
Professional role	56.105	3	0.000	Yes (min. = 19.0)	Reject H_0
Automation-human balance	42.553	4	0.000	Yes (min. = 15.2)	—

role (χ^2 = 56.105, df = 3, p<0.001), confirming that perceptions of AI's automation-human balance differ meaningfully across professional categories. All expected cell frequencies exceed the minimum threshold of five, ensuring the statistical validity of the test. SH_1 is therefore supported: professional role is a significant moderator of human-centric AI perceptions, with implications for the design of role-differentiated AI governance and communication strategies within organisations.

9.4 Contextual Analyses: Demographic and Organisational Variables

To contextualise the primary findings, supplementary analyses assessed the influence of demographic and organisational variables

Table 6. Summary of supplementary statistical tests

Variable	Outcome measure	Test	F/t/χ^2	p-value	Decision
Age	AI Perception Scores	ANOVA	F = 1.078	0.392	Fail to Reject H_0
Gender	Work-Life Balance Perception	t-test	t = −0.814	0.418	Fail to Reject H_0
Experience	AI Transparency Trust	ANOVA	F = 0.796	0.500	Fail to Reject H_0
Organisation Size	Decision-Making Quality	ANOVA	F = 0.961	0.416	Fail to Reject H_0
Sector	Resource Utilisation	Chi-Square	χ^2 = 87.421	0.000	Reject H_0
Sector	Employee Retention	Chi-Square	χ^2 = 45.711	0.000	Reject H_0
HR Innovation	Employee Retention	Correlation	r = 0.563	0.000	Reject H_0

on AI perceptions in HRM. Table 6 summarises these results.

The supplementary analyses reveal an analytically coherent pattern: demographic variables (age, gender, experience, and organisation size) exert no statistically significant influence on AI perceptions in HRM, indicating that perceptions of AI in this context are not shaped by individual-level characteristics alone. By contrast, industry sector and professional role emerge as significant contextual moderators. Sector significantly influences perceptions of resource utilisation ($\chi^2 = 87.421$, $p<0.001$) and employee retention ($\chi^2 = 45.711$, $p<0.001$), while a moderate positive correlation between HR innovation capability and employee retention ($r = 0.563$, $p<0.01$) reinforces the strategic importance of AI-driven HR innovation for talent retention outcomes.

10. Discussion

The findings of this study carry several theoretically and practically significant implications for the integration of AI within the Industry 5.0-informed SHRM framework.

The confirmation of H_1 that perceptions of AI's automation-human balance are significantly positively associated with sustainability perceptions constitutes the study's most substantive contribution. This result empirically validates a core normative proposition of Industry 5.0: that the instrumental value of AI in organisational settings is conditional upon its alignment with human-centric principles. Organisations that deploy AI-enabled HR tools in ways perceived as respectful of human agency, transparent in decision-making, and supportive of employee wellbeing are more likely to cultivate perceptions of sustainable HR practice. This finding is consistent with Brown *et al.* (2024) and aligns with the European Commission's (2024) regulatory emphasis on human-centric AI as a prerequisite for sustainable industrial development.

The significant moderation of human-centric AI perceptions by professional role (SH_1 supported; $\chi^2 = 56.105$, $p<0.001$) suggests that HR professionals, senior managers, and general employees do not occupy a uniform epistemic position with respect to AI's human-centric orientation. This differential may reflect asymmetries in information access, decision-making authority, and proximity to AI deployment processes across organisational levels. It implies that a differentiated communication and training strategy is required: while senior managers and HR professionals may engage with AI governance at a policy level, general employees require tangible, experiential evidence of AI's human-centric intent through direct interactions with AI-enabled HR systems.

The absence of significant demographic effects (age, gender, experience, organisation size) on AI perceptions is also noteworthy. Contrary to technology acceptance research that has frequently identified age and experience as significant adoption moderators (Chen *et al.*, 2024), the present findings suggest that in the Indian IT context, exposure to AI-enabled HR tools may be sufficiently uniform across demographic groups to attenuate these effects. Alternatively, the dominance of younger respondents (61.8% aged 21-30) in the sample may have compressed variance in technology

familiarity, limiting the detectability of age-related differences. Future research with more age-diverse samples is warranted to revisit this finding.

The significant sector-level differences in perceptions of AI's impact on resource utilisation and employee retention affirm that AI's value proposition in HRM is not sector-agnostic. Technology and services sector respondents, who are more directly embedded in digital work environments, may have richer and more differentiated mental models of AI's HR applications compared to respondents from manufacturing or healthcare. This sectoral heterogeneity has important implications for HR technology vendors and organisational change managers, who must calibrate AI implementation strategies to sector-specific workforce characteristics and digital maturity levels.

11. Conclusion

This study has empirically investigated the relationship between employee perceptions of AI's human-centric orientation and perceptions of organisational sustainability within the Industry 5.0 framework, drawing on primary data from 76 respondents in the Mysuru IT sector. The central finding, a statistically significant moderate positive association between perceived automation human balance and sustainability perceptions ($r = 0.464$, $p<0.01$), provides empirical grounding for the normative claim that human-centric AI design is not merely an ethical aspiration but a strategic enabler of sustainable organisational outcomes.

The study further demonstrates that professional role is a significant moderator of human-centric AI perceptions, while individual demographic variables (age, gender, experience) do not exert significant influence, underscoring the primacy of organisational positioning over personal characteristics in shaping attitudes toward AI in HR. Sector-level variation in perceptions of resource utilisation and employee retention further highlights the contextual embeddedness of AI's value creation in HRM.

From a practical standpoint, these findings counsel organisations to foreground human-centric values in both the design and communication of AI-enabled HR systems, to develop role-differentiated AI literacy and governance programmes, and to treat the balancing of automation with human agency not as a regulatory compliance exercise but as a genuine sustainability strategy. From a scholarly standpoint, the study advances an empirically grounded, Industry 5.0-informed SHRM framework that situates human-centric AI deployment at the intersection of technological capability and organisational sustainability.

The study is subject to certain limitations. The cross-sectional design precludes causal inference; the sample, while representative of the Mysuru IT ecosystem, limits generalisability; and the dominance of younger respondents may constrain the detectability of age-related effects. Future research should employ longitudinal designs, extend sampling to a broader geographic and sectoral scope, and integrate qualitative methods to capture the experiential dimensions of human-centric AI deployment.

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