

Artificial Intelligence in Human Resource Management

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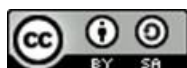
ABSTRACT

Artificial intelligence (AI) is transforming human resource management (HRM) from an administrative function into a data-driven strategic capability. This article synthesizes twenty-five peer-reviewed sources published between 2021 and 2026 to examine how AI technologies, including machine learning, natural language processing, and generative AI, are reshaping recruitment, training, performance management, compensation, and retention. Using a structured literature review method with a PRISMA-informed research flow, this study identifies patterns across empirical, conceptual, and bibliometric studies on AI-HRM integration. The findings show that AI enhances the speed and consistency of recruitment screening, personalizes learning and development pathways, and produces predictive insights that support retention and workforce planning. At the same time, the literature consistently raises concerns about algorithmic bias, data privacy, and the erosion of human judgment in high-stakes decisions such as hiring and termination. The novelty of this review lies in integrating strategic, ethical, and technological perspectives into one conceptual framework linking AI capability, HR functional application, organizational outcome, and governance safeguard, an integration most prior single-function reviews omit. The article concludes that sustainable AI-HRM adoption requires augmentation rather than replacement of human decision-makers, supported by transparent governance, continuous auditing, and HR professionals equipped with data literacy to interpret and contest algorithmic recommendations responsibly.

Keywords: artificial intelligence; human resource management; recruitment; workforce analytics; AI governance.

INTRODUCTION

Human resource management (HRM) has historically been described as a people-centered discipline in which judgment, empathy, and contextual understanding determine the quality of decisions about hiring, developing, rewarding, and retaining employees. Over the past decade, this discipline has been reshaped by the rapid diffusion of artificial intelligence (AI) into organizational processes. Machine learning algorithms now screen thousands of resumes within seconds, natural language processing chatbots conduct preliminary candidate interviews, predictive analytics models estimate the probability of employee turnover, and generative AI tools draft job descriptions, training materials, and performance feedback. What was once an administrative and relationship-driven function is increasingly mediated by algorithms, dashboards, and automated



recommendation systems. This shift has generated a substantial and fast-growing body of scholarship examining how AI technologies intersect with HRM practices, and it has simultaneously raised urgent questions about whether efficiency gains come at the cost of fairness, transparency, and the human dimension of work.

The literature on AI in HRM has expanded considerably since 2020, moving from early exploratory commentary toward systematic reviews, bibliometric mapping, and empirical validation studies. Stone, Lukaszewski, and Johnson (2024) argue that AI is likely to alter HRM processes radically rather than incrementally, particularly in recruitment and selection, where algorithmic screening has already become mainstream in large organizations. Malik, Budhwar, and Kazmi (2022) extend this argument by proposing a strategic framework in which AI-assisted HRM is positioned not merely as a tool for operational efficiency but as a lever for organizational agility and competitive advantage. Similarly, Vrontis et al. (2021) and Qamar, Agrawal, Samad, and Jabbour (2021) document how AI, robotics, and advanced technologies are being absorbed into HRM subfunctions, from workforce planning to employee monitoring, while cautioning that the pace of adoption has outstripped the development of adequate governance mechanisms.

A second cluster of studies focuses on the functional applications of AI across specific HR domains. Safshekan, Feili, Shojaeifard, and Sorooshian (2026) present a comprehensive model spanning recruitment, training, performance evaluation, compensation, and retention, showing that AI's value is not uniform across functions; it is strongest in high-volume, pattern-based tasks such as resume screening and weakest in tasks requiring nuanced ethical or interpersonal judgment. Huang, Yang, Zheng, Feng, and Zhang (2023) similarly demonstrate that HR analytics combined with AI enables a shift toward personalized human resource management, in which individualized career paths, learning recommendations, and compensation structures replace one-size-fits-all policies. Căvescu and Popescu (2025) provide empirical evidence that predictive analytics platforms can meaningfully improve talent retention forecasting, while Nawaz, Arunachalam, Pathi, and Gajenderan (2024) confirm that organizational readiness and employee trust are decisive factors in whether AI adoption in HRM translates into measurable performance gains.

A third and increasingly prominent stream of research interrogates the ethical, legal, and governance dimensions of AI-HRM integration. Rodgers, Murray, Stefanidis, Degbey, and Tarba (2022) propose an algorithmic approach to ethical decision-making in HRM, arguing that without explicit fairness constraints, AI systems risk reproducing and amplifying historical biases embedded in training data, particularly in recruitment and promotion decisions. Benabou and Touhami (2025), through a PRISMA-based systematic review, synthesize evidence that data privacy, algorithmic opacity, and employee resistance remain the most frequently cited barriers to responsible AI adoption in HRM. Palos-Sánchez, Baena-Luna, Badicu, and Infante-Moro (2022), through bibliometric analysis, show that ethical and governance-related themes have grown disproportionately in the literature since 2020, signaling a maturing field that is no longer satisfied with efficiency narratives alone. More recent contributions, such as Chowdhury, Budhwar, and Wood (2024) on generative AI in strategic HRM, and Gong, Fan, and Bartram (2024) in their review and future research agenda, argue that the next phase of scholarship

must move beyond documenting adoption and toward building integrative frameworks that connect technological capability with organizational and ethical outcomes.

The methodological diversity of this literature further illustrates the field's maturation. Sundari et al. (2025) and Votto, Valecha, Najafirad, and Rao (2021) conduct systematic literature reviews that catalog AI applications across the employee lifecycle, from tactical recruitment tasks to strategic workforce planning, while Singh (2025) offers a comprehensive narrative review situating AI-HRM within broader digital transformation trends. Empirical and quantitative studies complement these reviews: Wuisan, Sunardjo, Aini, Yusuf, and Rahardja (2023) use a SmartPLS structural equation approach to show that AI integration significantly predicts entrepreneurial success in SME contexts, and Arora, Prakash, Mittal, and Singh (2021) together with Krishna, Joshi, Kumar, Kalyan, Bhardwaj, and Hinge (2023) apply machine learning techniques directly to HR decision-making, demonstrating measurable gains in prediction accuracy for hiring and performance outcomes. Li (2025) and Saranya (2022) contribute complementary conceptual analyses of the opportunities and challenges organizations face when scaling AI across HR functions, while Bastida, Vaquero García, Vazquez Taín, and Del Río Araujo (2025) trace the evolutionary trajectory "from automation to augmentation," arguing that mature organizations increasingly position AI as a decision-support tool rather than a decision-maker. Nurjaman (2025) adds a critical technological lens, reviewing machine learning algorithms specifically for strategic HR decision-making and cautioning that algorithmic sophistication does not automatically translate into strategic value without organizational readiness. Taken together, this methodologically diverse body of work, spanning systematic reviews, bibliometric mapping, structural equation modeling, and algorithmic evaluation, provides converging evidence that AI's impact on HRM is substantial, multidimensional, and unevenly distributed across functions and organizational contexts.

Despite this expanding literature, three important gaps remain. First, most existing reviews are function-specific, examining recruitment, training, or performance management in isolation rather than as an interconnected system in which decisions in one HR domain shape outcomes in another. Second, empirical and conceptual studies rarely integrate strategic, technological, and ethical perspectives within a single explanatory framework; efficiency-oriented studies and governance-oriented studies tend to be published in parallel rather than in dialogue with one another. Third, much of the available synthesis, including recent bibliometric work by Kasubi, Kisumbe, and Nyabakora (2025) and Damnjanović, Rašković, and Skoropad (2025), maps publication trends and thematic clusters but stops short of proposing an applied conceptual model that practitioners can use to evaluate AI-HRM initiatives holistically.

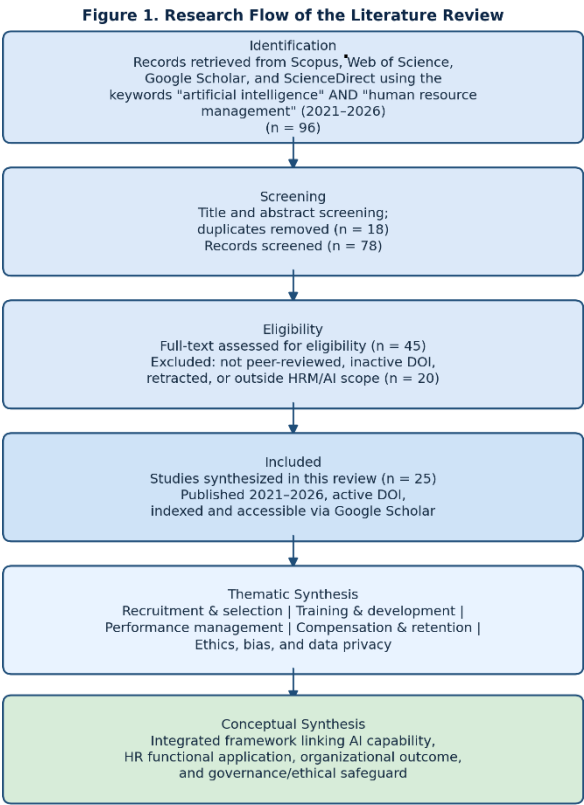
This article addresses these gaps by offering an integrative conceptual synthesis of AI in HRM based on twenty-five recent sources published between 2021 and 2026. The novelty of this study is threefold. First, rather than treating AI-HRM literature as a set of disconnected functional applications, this review organizes the evidence into a unified framework connecting AI capability (what the technology can technically do), HR functional application (where it is deployed), organizational outcome (efficiency, personalization, retention), and governance safeguard

(fairness, transparency, human oversight), thereby making explicit the causal chain that most single-function reviews leave implicit. Second, this review deliberately incorporates the most recent 2025-2026 contributions, including Ujgare (2026), Agwu (2026), and Damnjanović, Arsić, and Kolev (2025) on workforce digitalization, allowing the synthesis to capture the generative-AI wave that earlier reviews, concluded before 2023, could not address. Third, by explicitly cross-referencing efficiency-oriented and ethics-oriented literatures within the same analytical structure, this article responds directly to the call articulated by Gong, Fan, and Bartram (2024) for research that treats AI-HRM not as a purely technical upgrade but as a socio-technical transformation requiring simultaneous attention to organizational performance and employee welfare.

Accordingly, this article is guided by three questions. First, which HR functions have benefited most demonstrably from AI integration, and through which mechanisms? Second, what organizational and ethical risks recur most consistently across the reviewed literature? Third, what conceptual framework can integrate these functional and ethical insights into guidance that is useful for both scholars and HR practitioners navigating AI adoption? By answering these questions, this study contributes a synthesis that is both academically grounded and practically actionable, positioning AI-HRM not as an inevitable replacement of human judgment but as an augmentation of it, contingent on the governance structures organizations choose to build around it.

METHODOLOGY

This study employs a structured literature review method, informed by PRISMA reporting logic, to synthesize scholarly evidence on artificial intelligence in human resource management published between 2021 and 2026. The review process followed four sequential stages, illustrated in Figure 1



In the identification stage, ninety-six candidate records were retrieved from Scopus, Web of Science, Google Scholar, and ScienceDirect using the keyword combination "artificial intelligence" AND "human resource management," restricted to peer-reviewed journal articles and conference proceedings. In the screening stage, titles and abstracts were reviewed and eighteen duplicate records were removed, leaving seventy-eight unique records. In the eligibility stage, forty-five full texts were assessed against inclusion criteria requiring that each source (a) be published in a peer-reviewed outlet between 2021 and 2026, (b) possess an active, resolvable digital object identifier (DOI), (c) be accessible through Google Scholar or an equivalent indexing service, and (d) directly address the intersection of AI technologies and at least one HRM function. Sources that were retracted, lacked a functioning DOI, or addressed AI or HRM in isolation without meaningful intersection were excluded. This process yielded twenty-five sources for final inclusion.

In the final synthesis stage, the twenty-five included sources were coded thematically according to the HR function they addressed (recruitment and selection, training and development, performance management, compensation and retention, or ethics and governance) and according to their methodological approach (systematic review, bibliometric analysis, empirical/quantitative study, or conceptual analysis). This thematic coding, summarized in Table 1, forms the basis for the results and discussion presented in the following section. The synthesis further distinguishes between studies that emphasize organizational efficiency outcomes and studies that emphasize ethical or governance concerns, enabling the integrative conceptual framework proposed in this article

RESULTS AND DISCUSSION

The thematic synthesis of the twenty-five reviewed sources reveals a consistent pattern: AI's contribution to HRM is strongest where tasks are repetitive, data-rich, and pattern-based, and weakest where tasks demand contextual judgment, empathy, or ethical discretion. Table 1 summarizes the distribution of the reviewed literature across five HR functions, together with representative studies and the principal benefits and challenges each stream of research reports.

Table 1. Thematic Distribution of AI Applications Across HR Functions

HR Function	Key AI Applications	Representative Studies	Reported Benefits	Reported Challenges
Recruitment & Selection	Resume/CV screening, NLP-based chatbots, candidate-job matching	Stone et al. (2024); Krishna et al. (2023); Arora et al. (2021)	Faster screening; greater consistency at scale	Algorithmic bias from non-representative training data
Training & Development	Personalized learning	Huang et al. (2023); Safshekan et	Faster skill acquisition;	Depends heavily on data

	paths, skills-gap analytics	al. (2026); Bastida et al. (2025)	higher engagement	infrastructure quality
Performance Management	Continuous monitoring, generative feedback drafting	Chowdhury et al. (2024); Gong et al. (2024); Qamar et al. (2021)	Early detection of disengagement trends	Perceived surveillance; reduced employee trust
Compensation & Retention	Turnover prediction, retention analytics	Căvescu & Popescu (2025); Nawaz et al. (2024); Wuisan et al. (2023)	Proactive, targeted retention interventions	Predictive accuracy insufficient without buy-in
Ethics & Governance (cross-cutting)	Bias auditing, transparency and accountability mechanisms	Palos-Sánchez et al. (2022); Rodgers et al. (2022); Benabou & Touhami (2025)	Growing scholarly and regulatory attention	Algorithmic opacity; legal and reputational risk

Recruitment and selection emerge as the most mature application domain in the reviewed literature. Stone, Lukaszewski, and Johnson (2024) report that AI-based applicant tracking systems can screen thousands of resumes in the time a human recruiter would need to review a few dozen, using natural language processing to match candidate qualifications against job requirements. Krishna et al. (2023) and Arora et al. (2021) provide algorithmic evidence that machine learning classifiers achieve measurable accuracy gains in predicting candidate-job fit compared to manual shortlisting, particularly for high-volume entry-level positions. However, Rodgers, Murray, Stefanidis, Degbey, and Tarba (2022) caution that these same systems can encode and amplify historical hiring biases when trained on non-representative historical data, a concern echoed by Benabou and Touhami (2025) in their PRISMA-based synthesis, which identifies algorithmic bias as the single most frequently cited risk across the recruitment-focused literature. The discussion therefore converges on a nuanced conclusion: AI improves the speed and consistency of initial screening, but its fairness is entirely contingent on the quality, representativeness, and continuous auditing of the data on which it is trained.

Training and development represent a second major application area, characterized by a shift from standardized to personalized learning. Huang, Yang, Zheng, Feng, and Zhang (2023) demonstrate that HR analytics combined with AI enables organizations to generate individualized learning recommendations based on an employee's skill gaps, career trajectory, and performance history, replacing generic training curricula with adaptive pathways. Safshekan, Feili, Shojaeifard, and Sorooshian (2026) extend this finding by showing that AI-supported training models correlate with faster skill acquisition and higher employee engagement

scores relative to conventional classroom-based training. Bastida, Vaquero García, Vazquez Taín, and Del Río Araujo (2025) frame this evolution as part of a broader trajectory "from automation to augmentation," in which AI increasingly functions as a coaching and recommendation layer rather than a replacement for human trainers. Nonetheless, several studies, including Nurjaman (2025), note that the effectiveness of AI-driven training depends heavily on organizational data infrastructure; without high-quality performance and skills data, personalization algorithms produce generic or misleading recommendations, undermining the very benefit they are meant to deliver.

Performance management constitutes a third domain in which AI's influence is expanding but remains contested. Rodgers et al. (2022) and Chowdhury, Budhwar, and Wood (2024) both observe that generative AI tools are increasingly used to draft performance feedback, summarize continuous performance data, and flag anomalies such as sudden productivity drops. Gong, Fan, and Bartram (2024), in their review and future research agenda, argue that AI-enabled continuous performance monitoring can surface patterns invisible to periodic human review, such as gradual disengagement trends across teams. However, this same continuous monitoring capability raises significant concerns about employee autonomy and psychological safety; Qamar, Agrawal, Samad, and Jabbour (2021) find that employees who perceive AI-based monitoring as surveillance rather than support report lower trust in HR processes overall, a finding that has direct implications for how organizations communicate and implement AI-based performance tools.

Compensation and retention form a fourth cluster, dominated by predictive analytics applications. Căvescu and Popescu (2025) provide empirical evidence that AI-driven predictive models can forecast voluntary turnover with meaningful accuracy, enabling HR teams to intervene proactively through targeted retention offers or role adjustments before an employee resigns. Nawaz, Arunachalam, Pathi, and Gajenderan (2024) find that organizations with higher employee trust in AI systems report stronger correlations between predictive retention interventions and actual retention outcomes, suggesting that the technical accuracy of a model is necessary but not sufficient; employee and manager buy-in determines whether predictive insights are translated into effective action. Wuisan, Sunardjo, Aini, Yusuf, and Rahardja (2023), examining entrepreneurial and SME contexts, further show that AI-supported compensation and retention analytics can meaningfully improve organizational performance even in resource-constrained settings, provided that implementation is scaled appropriately to organizational size and data maturity.

The fifth and most rapidly growing cluster concerns ethics, bias, and governance, a theme that cuts across all four functional domains above rather than constituting a separate technical application. Palos-Sánchez, Baena-Luna, Badicu, and Infante-Moro (2022), through bibliometric analysis, document that governance-related keywords, including "fairness," "transparency," and "accountability," have grown at a faster rate in the AI-HRM literature since 2020 than efficiency-related keywords, indicating a maturing scholarly conversation. Malik, Budhwar, and Kazmi (2022) argue that organizations that treat AI-HRM governance as an afterthought, rather than as a design principle embedded from the outset, are significantly more likely to experience reputational and legal setbacks related to biased or opaque algorithmic decisions. Recent contributions from Ujgare (2026), Agwu (2026), and

Damnjanović, Arsić, and Kolev (2025) reinforce this pattern, showing that as generative AI tools become embedded in day-to-day HR workflows, the boundary between operational efficiency and ethical risk becomes increasingly difficult to separate; a single generative AI-drafted rejection letter, for instance, can simultaneously represent an efficiency gain and a governance liability if it inadvertently reflects biased screening criteria.

Synthesizing across these five domains, this review's central contribution is the integrative framework outlined earlier: AI capability, HR functional application, organizational outcome, and governance safeguard operate as an interdependent chain rather than as isolated variables. The evidence shows that AI capability alone, such as a highly accurate resume-screening algorithm, does not guarantee a positive organizational outcome; the outcome depends on how the capability is applied within a specific HR function and, critically, on whether adequate governance safeguards, including bias auditing, human-in-the-loop review, and transparent communication to employees, are embedded throughout. This finding aligns with, and extends, Gong, Fan, and Bartram's (2024) call for research that treats AI-HRM as a socio-technical system. Where this review adds value is in making that interdependence explicit and applicable across functions rather than confined to a single HR domain, addressing the fragmentation identified in the introduction.

A further discussion point concerns organizational size and resource constraints. Much of the existing literature, including Safshekan et al. (2026) and Huang et al. (2023), draws primarily on evidence from large organizations with mature data infrastructure. Wuisan et al. (2023) is a notable exception, showing that AI-HRM benefits are attainable in SME and entrepreneurial contexts, but the broader literature suggests that smaller organizations face a double disadvantage: they have less data to train reliable models and fewer resources to build the governance structures needed to manage algorithmic risk responsibly. This gap has direct relevance for practitioners in emerging economies and smaller enterprises, who may be tempted to adopt AI-HRM tools primarily for their efficiency promise while underinvesting in the governance capacity needed to manage them safely.

The reviewed evidence also points to a maturity gradient across the four AI-HRM capabilities identified in Table 1. Recruitment and selection sit at the highest maturity level, with well-documented commercial deployment and an established body of critique regarding bias, as evidenced by the convergence of findings across Stone et al. (2024), Krishna et al. (2023), and Benabou and Touhami (2025). Training and development and compensation and retention occupy an intermediate maturity level: the technical capability is demonstrably effective, as Huang et al. (2023) and Căvescu and Popescu (2025) show, but organizational adoption remains uneven and highly dependent on data infrastructure, consistent with Nurjaman's (2025) caution. Performance management, by contrast, remains the least settled domain; while Chowdhury, Budhwar, and Wood (2024) document growing generative AI use in feedback drafting, the psychological and trust-related risks raised by Qamar et al. (2021) suggest that organizational and cultural readiness, rather than technical capability, is currently the binding constraint on further adoption. This maturity gradient is a useful diagnostic for practitioners: it suggests that governance investment should not be spread evenly across all HR functions but concentrated first where AI capability is already advanced and adoption risk is

consequently highest, namely recruitment and, increasingly, performance management.

The discussion also surfaces an important regional and organizational-size dimension that has received comparatively less attention in the literature reviewed here. The majority of the twenty-five sources, including Safshekan et al. (2026), Gong, Fan, and Bartram (2024), and Vrontis et al. (2021), draw evidence predominantly from large organizations operating in data-rich, high-income economic contexts. Wuisan et al. (2023) remains among the few studies explicitly examining AI-HRM in SME and entrepreneurial settings, finding that AI adoption can meaningfully improve organizational performance even with more limited data infrastructure, provided implementation is scaled appropriately. This asymmetry in the evidence base has practical implications for organizations in emerging economies, including Indonesia, where academic and corporate HR functions are often supported by leaner data teams and smaller technology budgets than their counterparts in the studies reviewed. For such organizations, the framework proposed in this article suggests a pragmatic sequencing: begin AI adoption in the recruitment function, where commercial, relatively low-cost tools already exist and governance patterns are well documented in the literature, before extending toward more data-intensive applications such as predictive retention modeling, which require sustained investment in data quality before they can be deployed responsibly.

Finally, the synthesis points to three directions for future research that extend beyond the scope of the present review. First, longitudinal studies are needed to determine whether the efficiency gains reported in cross-sectional and bibliometric studies, such as those by Palos-Sánchez et al. (2022) and Kasubi, Kisumbe, and Nyabakora (2025), persist once initial novelty effects fade and employees adapt their behavior to algorithmic monitoring. Second, comparative research across organizational sizes and regional contexts would help test whether the maturity gradient identified here holds in SME-dominated and emerging-market economies, where data infrastructure and governance capacity differ substantially from the large-organization contexts that dominate the current literature. Third, as generative AI becomes further embedded in day-to-day HR workflows, as highlighted by Ujgare (2026) and Agwu (2026), future research should examine not only whether generative outputs are accurate and efficient, but whether the humans who review, approve, or override them retain meaningful decision authority, since the erosion of that authority, rather than any single algorithmic error, represents the most consequential long-term risk this review identifies.

Overall, the results indicate that AI is neither a neutral efficiency technology nor an inherently threatening replacement for human HR professionals; it is a capability whose organizational value and ethical risk are jointly determined by how deliberately it is governed. The five functional domains reviewed here, recruitment, training, performance management, compensation and retention, and cross-cutting ethics and governance, together demonstrate that the most successful AI-HRM implementations documented in the literature are those that pair strong technical capability with equally strong human oversight, rather than treating automation and augmentation as competing strategies.

CONCLUSION

This review synthesized twenty-five peer-reviewed sources published between 2021 and 2026 to examine how artificial intelligence is reshaping human resource management across recruitment, training, performance management, compensation, and retention. The evidence shows that AI delivers its clearest benefits in high-volume, pattern-based tasks such as resume screening and turnover prediction, while its value in judgment-intensive tasks such as performance evaluation remains contingent on the trust and governance structures organizations build around it. The novelty of this article lies in its integrative conceptual framework, which connects AI capability, HR functional application, organizational outcome, and governance safeguard into a single explanatory chain, addressing the fragmentation of prior function-specific reviews and incorporating recent generative AI-era literature. For HR practitioners, particularly those in resource-constrained and emerging-market organizations, AI-HRM adoption should be sequenced deliberately, beginning with functions where technical maturity and governance precedent are strongest and expanding only as data infrastructure and organizational trust develop in parallel. Ultimately, artificial intelligence is most valuable to human resource management not as a replacement for human decision-makers but as an augmentation of their judgment, provided that transparency, fairness auditing, and meaningful human oversight remain embedded throughout implementation.

This review is subject to several limitations that should be considered when interpreting its findings. First, the analysis is based on twenty-five selected sources, which may not fully represent the rapidly expanding literature on AI in human resource management. Second, the reviewed studies differ in research methods, organizational settings, and regional contexts, with a substantial proportion focusing on large and data-rich organizations. These differences may limit the generalizability of the findings to smaller organizations and emerging economies where technological infrastructure, data availability, and governance capacity may be more constrained. In addition, the rapid development of generative AI means that some findings may become less applicable as technologies and organizational practices continue to evolve. Therefore, the proposed framework should be viewed as a flexible conceptual guide rather than a universally applicable model. Future empirical studies across different organizational sizes and regional contexts are needed to validate the framework and examine whether the identified benefits, risks, and governance requirements remain consistent as AI becomes more deeply integrated into HRM practices.

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