

# Unlocking the Potential: Literature Review on the Evolving Role of AI in HRM

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## Abstract

This paper explores the evolution and strategic significance of Artificial Intelligence (AI) in Human Resource Management (HRM). Tracing AI's journey from rudimentary automation to sophisticated systems, it focuses on the impact of AI, particularly in Natural Language Processing (NLP) for recruitment and AI-driven employee engagement solutions. The study delves into challenges, opportunities, and ethical considerations, aiming to identify gaps in existing knowledge. The research aims to provide a comprehensive understanding of the current state of AI integration in HRM, with key objectives including defining scope, exploring technologies, presenting case studies, and unravelling regulatory and ethical dimensions. This abstract sets the stage for a nuanced exploration of AI-HRM dynamics.

**Keywords:** Artificial Intelligence, Human Resource Management, evolution, Natural Language Processing, employee engagement, ethical considerations

## 1. Introduction

The evolution of Artificial Intelligence (AI) within the domain of Human Resource Management (HRM) has ushered in a transformative era, reshaping conventional practices and offering new avenues for strategic workforce management (Basnet, 2024). Tracing the historical trajectory of AI in HRM unveils a journey from rudimentary automation to sophisticated systems, setting the stage for a nuanced exploration of its contemporary significance.

The strategic importance of integrating AI into HRM extends beyond mere operational enhancements. It signifies a fundamental shift in the approach to talent management, empowering HR professionals to navigate the intricacies of recruitment, employee engagement, and overall organizational productivity in an ever-evolving landscape (Thakur, 2023).

As we delve into this dynamic intersection, the research problem comes into sharper focus. The literature review aims to meticulously narrow down specific areas within AI-HRM integration, scrutinizing challenges, opportunities, and ethical considerations while identifying critical gaps in existing knowledge.

This exploration homes in on a specific research problem: understanding how AI, particularly in Natural Language Processing (NLP) for recruitment and AI-driven employee engagement solutions, influences and shapes organizational efficiency and productivity within HRM (Xiao et al., 2023).

In response to this refined research problem, the overarching aim of this research is to provide a comprehensive understanding of the current state of AI integration in HRM. The objectives encompass defining the scope, exploring existing AI technologies, presenting relevant case studies, and unravelling the regulatory and ethical considerations that underpin this intricate relationship.

## 2. Historical Context of AI in HRM

## 2.1 Pioneering Technologies in HRM

The historical evolution of artificial intelligence (AI) within Human Resource Management (HRM) is a multifaceted journey deeply intertwined with technological advancements and scholarly insights.

The origins of human resources automation date back to the late 1960s, as highlighted by IceHrm (2020). Initial endeavors in automation predominantly focused on rudimentary data processing and record retention, tasks conventionally delegated to computer systems (Spring et al., 2022). Over time, technological progress facilitated the ascendance of Human Resources Management Systems (HRMS) and Enterprise Resource Planning (ERP) systems during the 1990s, marking the mainstream adoption and heralding a transformative phase in the domain of human resources automation (Peretz, 2013). The advent of automation in HR processes not only streamlined routine tasks but also initiated a paradigmatic shift towards more sophisticated AI applications (William et al., 2023). Scholars such as Pandey et al. (2023) argue that this early integration of automation laid the groundwork for a redefinition of HRM as a strategic function rather than merely an administrative one. The automation of routine tasks not only improved operational efficiency but also enabled HR professionals to pivot their focus towards more strategic initiatives, paving the way for the integration of AI-driven intelligence.

The subsequent integration of AI technologies into talent management practices from the late 20th is extensively documented in academic literature (Odugbesan et al., 2022, Gomathi et al., 2023, Sivathanu & Pillai, 2019). Pandey et al. (2023) provide in-depth insights into how AI-driven talent management systems revolutionized recruitment processes, emphasizing the role of machine learning algorithms in matching candidates with organizational culture and values. This phase marked not only a technological transformation but also a paradigm shift in HRM theories, with a greater emphasis on aligning organizational goals with individual motivations and aspirations.

## 2.2 Milestones in the Evolution of AI Applications

The transition from rule-based systems to machine learning represents a pivotal phase in the academic discourse surrounding AI in HRM. Research by Gheibi et al. (2021) delves into the intricacies of this transition, highlighting the dynamic adaptability of machine learning algorithms. The nuanced understanding of data patterns and the ability to evolve in response to changing contexts allowed HRM practices to transcend traditional constraints (Petani & Mengis, 2021). This academic exploration sheds light on the epistemological shifts in our understanding of HRM as a dynamic and adaptive field.

A significant academic contribution in the realm of AI in HRM is the exploration of ethical considerations. Scholars such as Rodgers et al. (2023) extensively discuss the ethical implications of AI-driven decision-making in HRM. The nuanced examination of bias, transparency, and accountability in AI systems has become a crucial aspect of academic discourse, shaping both theoretical frameworks and practical guidelines for ethical AI implementation in HRM (Bankins, 2021).

The evolution towards predictive analytics in HRM has garnered attention from researchers such as McCartney and Fu (2022). Their work emphasizes the strategic implications of predictive analytics in workforce planning, talent development, and overall organizational success. The academic discourse surrounding predictive analytics in HRM not only highlights its efficacy in decision-making but also raises questions about the ethical use of predictive models in shaping the future of human capital management.

The historical context of AI in HRM is a rich tapestry woven with insights from diverse academic perspectives. From the early stages of automation to the ethical considerations in AI-driven decision-making, scholarly research has played a pivotal role in shaping our understanding of HRM's evolution into a technologically advanced and ethically conscious discipline.

## 3. Current State of AI Integration in HRM

The academic exploration of AI integration in Human Resource Management (HRM) involves a nuanced examination of the theoretical frameworks, empirical studies, and methodological advancements that underpin its current state (Rafiq et al., 2024). A profound understanding of the subject necessitates a closer look at the theoretical foundations that guide the adoption and implementation of AI technologies in HR. Scholars such as Chowdhury et al. (2023) argue that the theoretical underpinnings of AI integration in HRM are deeply rooted in the Resource-Based View (RBV) and the Dynamic Capability Theory. RBV emphasizes how AI technologies can be considered strategic resources that provide a sustainable competitive advantage in the management of human capital (Samarasinghe & Medis, 2020). The Dynamic Capability Theory, on the other hand, highlights the organization's ability to adapt and innovate in response to changing technological landscapes, crucial in the context of AI integration (Talafidaryani, 2023).

Empirical studies have sought to validate these theoretical frameworks and shed light on the practical implications of AI in HRM. Research conducted by Dutta et al. (2022) employs a longitudinal approach to

analyze the impact of AI-driven employee engagement solutions on organizational performance indicators. Their findings not only affirm the positive relationship between AI-enhanced employee engagement and productivity but also identify key factors influencing successful implementation.

Moreover, methodological advancements in studying AI integration in HRM involve the application of advanced analytics and machine learning algorithms to assess the effectiveness of these technologies. Recent work by Birjali et al. (2021) utilizes natural language processing techniques to analyze textual data from employee surveys, uncovering hidden patterns in sentiment and engagement. This methodological approach provides a more granular understanding of the employee experience and the factors influencing AI adoption.

A critical examination of the ethical dimensions is essential in the academic discourse surrounding AI integration in HRM. Research by Mujtaba and Mahapatra (2019) delves into the ethical considerations associated with the use of AI in recruitment processes, exploring issues of fairness, transparency, and bias. This scholarly inquiry contributes to a broader understanding of the responsible deployment of AI technologies in HRM.

The academic landscape surrounding AI integration in HRM is characterized by a synthesis of theoretical frameworks, empirical studies, and methodological innovations. The Resource-Based View and Dynamic Capability Theory provide theoretical lenses, while empirical research and advanced analytics contribute practical insights. Ethical considerations add a layer of complexity, prompting scholars to critically evaluate the societal implications of AI technologies in HRM. This multidimensional approach advances our understanding of the current state of AI integration in HRM, laying the groundwork for future research and industry best practices.

#### **4. Regulatory and Ethical Considerations**

##### *4.1 Legal Frameworks Governing AI in HRM*

The exploration of regulatory and ethical dimensions in the integration of Artificial Intelligence (AI) into Human Resource Management (HRM) unveils a complex landscape shaped by legal frameworks and ethical considerations. Within the legal domain, compliance with data protection and privacy laws stands as a paramount concern (Walters et al., 2019). The burgeoning use of AI in HRM necessitates alignment with regulations such as the General Data Protection Regulation (GDPR) and other regional laws, ensuring that the collection, processing, and storage of employee data adhere to stringent privacy standards (Karpisz et al., 2019). This legal framework not only safeguards individual privacy but also establishes a foundation for responsible AI deployment within HRM (Chang & Ke, 2023).

In addition to legal considerations, addressing bias and ensuring fairness in AI decision-making processes is crucial. The algorithms powering AI systems are susceptible to biases present in historical data, potentially perpetuating inequalities (Schwartz et al., 2022). Scholars such as Tilmes (2022) emphasize the importance of algorithmic fairness and advocate for methodologies that actively identify and rectify biases. This legal and ethical imperative ensures that AI-driven HRM practices promote fairness, equity, and diversity, aligning with broader societal goals.

##### *4.2 Ethical Challenges in AI-Driven HRM*

Ethical challenges in AI-driven HRM extend beyond legal compliance, delving into the realms of transparency and accountability. Maintaining transparency in the functioning of AI algorithms is essential for building trust among employees and stakeholders (Felzmann et al., 2019). Ethical considerations underscore the need for organizations to provide clear explanations of how AI systems operate, the factors influencing decisions, and the consequences of those decisions (Nassar & Kamal, 2021). This transparency not only enhances organizational credibility but also empowers employees to understand and trust the AI-driven processes governing HRM practices.

Moreover, mitigating the risks of unintended consequences is a critical ethical consideration. AI systems, if not carefully designed and monitored, may lead to unintended outcomes or reinforce existing disparities. Research by Centre for the Governance of AI Future of Humanity Institute University of Oxford (2017) advocates for robust governance mechanisms that anticipate and address these unintended consequences. Organizations engaging in AI-driven HRM must proactively assess and manage potential risks, ensuring that the deployment of AI technologies aligns with ethical standards and organizational values (Rodgers et al., 2023).

Regulatory and ethical dimensions of AI integration in HRM constitute a multifaceted discourse. Legal frameworks guide compliance with data protection laws, while ethical considerations focus on addressing biases, ensuring fairness, promoting transparency, and mitigating unintended consequences. Navigating this intricate landscape demands a holistic approach that harmonizes legal obligations with ethical imperatives, establishing a foundation for responsible and socially conscious AI adoption in the field of Human Resource Management.

#### **5. Gaps in Existing Knowledge**

The exploration of gaps in existing knowledge within the context of AI integration in Human Resource Management (HRM) reveals critical insights into the current state of research and areas requiring further investigation. A comprehensive critique of current AI applications in HRM is imperative to understand the limitations and challenges associated with existing implementations. While AI has showcased transformative potential, scholars such as Lan Li et al., (2021) argue that a nuanced evaluation is necessary to identify areas where these technologies may fall short or produce suboptimal outcomes.

One significant challenge lies in the interpretability and explainability of AI-driven decision-making processes within HRM (Loi, 2020). Current applications often involve complex algorithms that, while delivering accurate results, lack transparency (BUITEN, 2019). This opacity poses challenges in understanding the rationale behind AI-driven decisions, hindering trust among employees and HR professionals (Zhou et al., 2023). Unraveling the intricacies of these algorithms and ensuring their interpretability is an area that warrants rigorous critique and exploration to enhance the ethical and practical aspects of AI adoption in HRM.

Beyond critiques, there exist unanswered questions that beckon further research and exploration. For instance, the ethical implications of using AI in performance evaluations and talent management demand in-depth investigation. The potential biases inherent in AI algorithms, even in the absence of explicit discriminatory intent, necessitate a thorough exploration of fairness and equity in HRM practices. Research by Koskimies & Kinder (2022) emphasizes the need for interdisciplinary collaboration to address these questions, bringing together experts in AI, ethics, and HRM to develop comprehensive frameworks that guide responsible AI deployment.

Furthermore, the adaptation of AI technologies in diverse organizational contexts and cultural settings requires nuanced exploration (Kulkov et al., 2023). Existing research often lacks granularity in addressing how AI applications in HRM may vary based on organizational size, industry, or cultural factors (Chowdhury et al., 2022). Investigating these contextual nuances is essential to ensure that AI solutions are not only effective but also culturally sensitive and adaptable to different organizational landscapes.

A critical examination of challenges and unanswered questions within current AI applications in HRM unveils the necessity for deeper critique and exploration. Interrogating the interpretability of AI-driven decisions and addressing ethical implications are crucial aspects that require scholarly attention. Moreover, delving into contextual factors influencing AI adoption in diverse organizational settings contributes to a more comprehensive understanding of the gaps in existing knowledge, guiding future research endeavors and shaping the trajectory of AI integration in the realm of Human Resource Management.

## 6. Conclusion

In summary, the evolution of AI-HRM integration has unfolded through key phases, starting with the inception of automation in the late 1960s and progressing to the contemporary era of sophisticated AI applications. This journey has not only streamlined HR practices but also elevated the field to a strategic level, emphasizing the adaptability of algorithms and the transformative impact of AI.

Looking ahead, insights for future research emphasize the need for transparency and interpretability in AI decision-making, guiding nuanced evaluations and interdisciplinary collaboration. Practical implications include positive outcomes from AI implementation in organizational efficiency and productivity, offering a roadmap for responsible and effective AI-HRM integration.

In conclusion, the summarized findings encapsulate the transformative trajectory of AI in HRM, providing valuable guidance for researchers and practitioners navigating the evolving landscape of AI integration in human resource management.

## References

- AI Governance: A research agenda - future of Humanity Institute, (2017). *AI Governance: A Research Agenda*. Available at: GovAI-Agenda.pdf (ox.ac.uk) (Accessed: 15 January 2024).
- Basnet, S., (2024). Artificial Intelligence and machine learning in Human Resource Management: Prospect and future trends. *International Journal of Research Publication and Reviews*, 5(1), pp. 281–287. doi:10.55248/gengpi.5.0124.0107.
- Bankins, S., (2021). The ethical use of Artificial Intelligence in human resource management: A decision-making framework. *Ethics and Information Technology*, 23(4), pp. 841–854. doi:10.1007/s10676-021-09619-6.
- Birjali, M., Kasri, M. and Beni-Hssane, A., (2021). A comprehensive survey on sentiment analysis: Approaches, challenges and Trends. *Knowledge-Based Systems*, 226, p. 107134. doi:10.1016/j.knosys.2021.107134.
- BUITEN, M.C., (2019). Towards intelligent regulation of artificial intelligence. *European Journal of Risk Regulation*, 10(1), pp. 41–59. doi:10.1017/err.2019.8.
- Chowdhury, S. et al., (2023). Unlocking the value of artificial intelligence in human resource management

- through AI Capability Framework'. *Human Resource Management Review*, 33(1), p. 100899. doi:10.1016/j.hrmr.2022.100899.
- Chowdhury, S. *et al.*, (2022). Embedding transparency in Artificial Intelligence Machine Learning Models: Managerial Implications on predicting and explaining employee turnover. *The International Journal of Human Resource Management*, 34(14), pp. 2732–2764. doi:10.1080/09585192.2022.2066981.
- Chang, Y. L. and Ke, J., (2023). Socially responsible artificial intelligence empowered people analytics: A novel framework towards Sustainability. *Human Resource Development Review*. doi:10.1177/15344843231200930.
- Dutta, D., Mishra, S.K. and Tyagi, D., (2022). Augmented employee voice and employee engagement using artificial intelligence-enabled Chatbots: A field study. *The International Journal of Human Resource Management*, 34(12), pp. 2451–2480. doi:10.1080/09585192.2022.2085525.
- Felzmann, H. *et al.*, (2019). Transparency you can trust: Transparency requirements for artificial intelligence between legal norms and contextual concerns. *Big Data & Society*, 6(1), p. 205395171986054. doi:10.1177/2053951719860542.
- Gheibi, O., Weyns, D. and Quin, F., (2021). On the impact of applying machine learning in the decision-making of self-adaptive systems. *2021 International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)* [Preprint]. doi:10.1109/seams51251.2021.00023.
- Gomathi, S., Rajeswari, A. and Kadry, S., (2023). Emerging HR practices — digital upskilling: A strategic way of talent management and Engagement. *Disruptive Artificial Intelligence and Sustainable Human Resource Management*, pp. 51–63. doi:10.1201/9781032622743-4.
- IceHrm, (2020). Evolution of the human resource information system, IceHrm. Available at: <https://icehrm.com/blog/evolution-of-human-resource-information-system/> (Accessed: 13 January 2024).
- Karpisz, D., Kielbus, A. and Zembytska, M., (2019). Selected problems of industry databases and Information Infrastructure Security. *Quality Production Improvement — QPI*, 1(1), pp. 371–377. doi:10.2478/cqpi-2019-0050.
- Koskimies, E. and Kinder, T., (2022). Mutuality in AI-enabled New Public Service Solutions. *Public Management Review*, pp. 1–26. doi:10.1080/14719037.2022.2078501.
- Kulkov, I. *et al.*, (2023). Artificial Intelligence - Driven Sustainable Development: Examining Organizational, technical, and processing approaches to achieving Global Goals. *Sustainable Development* [Preprint]. doi:10.1002/sd.2773.
- Li, L., Lassiter, T., Oh, J. and Lee, M.K., (2021). July. Algorithmic hiring in practice: Recruiter and HR Professional's perspectives on AI use in hiring. *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*, pp. 166–176.
- Loi, M., (2020). People Analytics must benefit the people. An ethical analysis of data-driven algorithmic systems in human resources management. Available at: [AlgorithmWatch\\_AutoHR\\_Study\\_Ethics\\_Loi\\_2020.pdf](#) (Accessed: 15 January 2024).
- McCartney, S. and Fu, N., (2022). Bridging the gap: Why, how and when HR analytics can impact organizational performance. *Management Decision*, 60(13), pp. 25–47. doi:10.1108/md-12-2020-1581.
- Mujtaba, D.F. and Mahapatra, N.R., (2019). Ethical considerations in AI-based recruitment. *2019 IEEE International Symposium on Technology and Society (ISTAS)* [Preprint]. doi:10.1109/istas48451.2019.8937920.
- Nassar, A. and Kamal, M., (2021). Ethical Dilemmas in AI-Powered Decision-Making: A Deep Dive into Big Data-Driven Ethical Considerations. *International Journal of Responsible Artificial Intelligence*, 11(8), pp. 1–11.
- Odugbesan, J.A. *et al.*, (2022). Green talent management and employees, Innovative Work Behavior: The roles of Artificial Intelligence and transformational leadership. *Journal of Knowledge Management*, 27(3), pp. 696–716. doi:10.1108/jkm-08-2021-0601.
- Pandey, A., Balusamy, B. and Chilamkurti, N., (2023). *Disruptive Artificial Intelligence and Sustainable Human Resource Management: Impacts and innovations — the future of HR*. Milton: River Publishers.
- Peretz, H., (2013). Information Technology Systems in the Human Resource Management Area. *Global Trends in Human Resource Management*, pp. 214–236. doi:10.1057/9781137304438.0018.
- Petani, F.J. and Mengis, J., (2021). Technology and the hybrid workplace: The affective living of it-enabled space. *The International Journal of Human Resource Management*, 34(8), pp. 1530–1553.

doi:10.1080/09585192.2021.1998186.

- Rafiq, M. *et al.*, (2024). *Exploring the intersection of AI and Human Resources Management*. Hershey, PA: Business Science Reference.
- Rodgers, W. *et al.*, (2023). An artificial intelligence algorithmic approach to ethical decision-making in Human Resource Management Processes. *Human Resource Management Review*, 33(1), p. 100925. doi:10.1016/j.hrmr.2022.100925.
- Samarasinghe, K.R. and Medis, Dr. A., (2020). Artificial Intelligence Based Strategic Human Resource Management (AISHRM) for industry 4.0. *Global Journal of Management and Business Research*, pp. 7–13. doi:10.34257/gjmborgvol20is2pg7.
- Sivathanu, B. and Pillai, R., (2019). Technology and talent analytics for talent management – A game changer for organizational performance. *International Journal of Organizational Analysis*, 28(2), pp. 457–473. doi:10.1108/ijoa-01-2019-1634.
- Spring, M., Faulconbridge, J. and Sarwar, A., (2022). How information technology automates and augments processes: Insights from artificial-intelligence-based systems in professional service operations. *Journal of Operations Management*, 68(6–7), pp. 592–618. doi:10.1002/joom.1215.
- Schwartz, R. *et al.*, (2022). *Towards a standard for identifying and managing bias in artificial intelligence*. doi:10.6028/nist.sp.1270.
- Talafidaryani, M., (2023). The effect of digital transformation on organizational performance: A dynamic capability-based model. *SSRN Electronic Journal* [Preprint]. doi:10.2139/ssrn.4656294.
- Tilmes, N., (2022). Disability, fairness, and algorithmic bias in AI recruitment. *Ethics and Information Technology*, 24(2). doi:10.1007/s10676-022-09633-2.
- Thakur, R., (2023). Introduction to artificial intelligence and its importance in modern business management. *Advances in Business Information Systems and Analytics*, pp. 133–165. doi:10.4018/979-8-3693-1902-4.ch009.
- Walters, R., Trakman, L. and Zeller, B., (2019). Data protection law. *Springer Nature*.
- William, P. *et al.*, (2023). Future of business organizations based on Robotic Process Automation. *Robotic Process Automation*, pp. 181–188. doi:10.1002/9781394166954.ch11.
- Xiao, Q., Yan, J. and Bamber, G.J., (2023). How does ai-enabled HR analytics influence employee resilience: Job crafting as a mediator and HRM system strength as a moderator. *Personnel Review* [Preprint]. doi:10.1108/pr-03-2023-0198.
- Zhou, Y., Wang, L. and Chen, W., (2023). The Dark Side of AI-enabled HRM on employees based on AI algorithmic features. *Journal of Organizational Change Management*, 36(7), pp. 1222–1241. doi:10.1108/jocm-10-2022-0308.

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