JRBME RESEARCH JOURNAL
JURNAL RISET BISNIS, MANAJEMEN, DAN ILMU EKONOMI
JRBME
ISSN 3047-2415 (ONLINE)

THE ARTIFICIAL INTELLIGENCE IMPACT IN EXPLAINING HUMAN RESOURCE DEVELOPMENT: A LITERATURE REVIEW APPROACH

Agung Widhi Kurniawan[1]; Muh. Yushar Mustafa[2]*
[1-2]*Program Studi Manajemen, Fakultas Ekonomi dan Bisnis, Universitas Negeri Makassar, Indonesia*
**Corresponding Email: m.yusharmustafa@unm.ac.id*

*ICI **Copernicus** Repository:*
https://journals.indexcopernicus.com/search/article?articleId=4704773

Abstract

Artificial Intelligence, or AI, has emerged as a transformative force in Human Resource Development, known as HRD, reshaping traditional paradigms of workforce training, talent management, and employee engagement. This literature review aims to synthesize existing research on the impact of AI on HRD, exploring various applications, challenges, and opportunities. The analysis reveals that AI enhances HRD practices through data-driven decision-making, personalized learning experiences, and efficient performance assessments. Notably, AI technologies enable organizations to identify skill gaps, provide tailored training solutions, and predict future workforce needs. However, the integration of AI into HRD is not without challenges; concerns regarding data privacy, algorithmic bias, and ethical implications remain prevalent. This review highlights the necessity for organizations to develop ethical guidelines and transparency in their AI applications to foster trust among employees. Furthermore, the literature underscores a gap in understanding the socio-cultural impacts of AI on workforce development, suggesting the need for further interdisciplinary research. By articulating both the advantages and limitations of AI in HRD, this study aims to provide practical insights for HR practitioners aiming to harness AI's potential while navigating its complexities. Ultimately, this literature review contributes to the ongoing discourse on the role of AI in shaping future HRD practices, emphasizing the importance of human-centric approaches alongside technological advancements.

Keywords: artificial intelligence, human resource development, human resource management, literature study, qualitative

Abstrak

Kecerdasan Buatan (AI) telah muncul sebagai kekuatan transformatif dalam Pengembangan Sumber Daya Manusia (SDM), yang dikenal sebagai HRD, mengubah paradigma tradisional dalam pelatihan tenaga kerja, manajemen talenta, dan keterlibatan karyawan. Tinjauan literatur ini bertujuan untuk mensintesis penelitian yang ada tentang dampak AI pada HRD, mengeksplorasi berbagai aplikasi, tantangan, dan peluang. Analisis menunjukkan bahwa AI meningkatkan praktik HRD melalui pengambilan keputusan berbasis data, pengalaman belajar yang dipersonalisasi, dan penilaian kinerja yang efisien. Secara khusus, teknologi AI memungkinkan organisasi untuk mengidentifikasi kesenjangan keterampilan, menyediakan solusi pelatihan yang disesuaikan, dan memprediksi kebutuhan tenaga kerja di masa depan. Namun, integrasi AI ke dalam HRD tidak tanpa tantangan; kekhawatiran terkait privasi data, bias algoritmik, dan implikasi etis tetap menjadi isu yang dominan. Tinjauan ini menyoroti kebutuhan bagi organisasi untuk mengembangkan pedoman etis dan transparansi dalam penerapan AI guna membangun kepercayaan di antara karyawan. Selain itu, literatur menyoroti kesenjangan dalam pemahaman dampak sosial-budaya AI terhadap pengembangan tenaga kerja, menyarankan perlunya penelitian interdisipliner lebih lanjut. Dengan menguraikan baik kelebihan maupun keterbatasan AI dalam HRD, studi ini bertujuan memberikan wawasan praktis bagi praktisi HR yang ingin memanfaatkan potensi AI sambil menavigasi kompleksitasnya. Pada akhirnya, tinjauan literatur ini

berkontribusi pada diskusi berkelanjutan tentang peran AI dalam membentuk praktik HRD di masa depan, dengan menekankan pentingnya pendekatan berorientasi manusia bersamaan dengan kemajuan teknologi.

***Kata kunci**: kecerdasan buatan, pengembangan sumber daya manusia, manajemen sumber daya manusia, studi literatur, kualitatif*

1. INTRODUCTION

The advent of Artificial Intelligence (AI) has revolutionized various domains, notably in Human Resource Development (HRD) (Akbar et al., 2024; Amran et al., 2024). As organizations embark on digital transformation journeys, AI technologies such as machine learning, natural language processing, and data analytics play significant roles in enhancing human resource (HR) functions (Gupta et al., 2024; Huu, 2023). HRD traditionally encompasses the strategic initiatives aimed at improving the knowledge, skills, and abilities of employees within an organization. With AI applications becoming increasingly prevalent in HR processes, a re-examination of how these technologies influence HRD is timely and necessary (Hajiali et al., 2022; Palupiningtyas et al., 2025). AI's capabilities allow organizations to analyze vast datasets, uncover patterns, and derive insights that inform strategic decision-making. In the context of HRD, AI can facilitate tailored training programs, identify competency gaps, promote individual learning paths, and enhance employee engagement. For instance, AI-driven learning platforms can recommend resources based on individual performance metrics, allowing for more personalized employee development. Additionally, AI assistants can streamline recruitment processes by identifying suitable candidates and assessing their potential fit within an organization.

Furthermore, although the growing body of literature addressing AI's applications in HR, there remains a notable scarcity of comprehensive analyses focusing specifically on its impact within HRD contexts. Existing studies have primarily concentrated on the technological aspects and implementations of AI without thoroughly investigating its implications for employee development and readiness for jobs of the future. This lack of focused research invites critical questions: How does AI mediate the processes of HRD? What are the potential challenges that organizations face in effectively implementing AI-driven HRD strategies? The novelty of this research lies in its targeted exploration of the intersection between AI and HRD. By synthesizing existing literature, the study aims to uncover the multifaceted relationships between AI technologies and workforce development, thereby contributing significantly to ongoing discussions in HR scholarship.

Based on the phenomena above, this study aims to explore the impact of AI on Human Resource Development by fulfilling several key objectives:

1. Analyze the role of AI in enhancing HRD practices: This involves examining how AI technologies facilitate training, performance monitoring, and employee engagement.
2. Identify the ethical implications and challenges associated with AI in HRD: The review will highlight concerns surrounding data privacy, algorithmic bias, and transparency.
3. Discuss the integration of robotics and emerging technologies in HRD: Investigating how robotics interplays with AI to shape workforce development strategies and competencies.
4. Propose future research directions: Identifying gaps in current literature and outlining potential avenues for further inquiry into AI’s role in HRD.

Through these objectives, the review aspires to provide meaningful insights for both academia and practice, emphasizing the importance of harmonizing technological advancements with human-centric development strategies.

2. LITERATURE REVIEW

Overview of Existing Literature. The literature on AI in HRD encompasses diverse perspectives, ranging from technological innovations to challenges posed by ethical considerations. This section categorizes existing research findings into three key areas, which are: (a) AI applications in HRD; (b) Integration Robotics Knowledge; and (c) ethical implications associated with AI usage.

a. **AI Applications in Human Resource Development**
   AI technologies have significantly influenced various HRD practices, enhancing efficiency in several domains. One of the prime areas of AI application is in training and development. Studies have shown that AI-driven learning platforms utilize algorithms to analyze employee performance and suggest personalized development paths (Kumar & Rema, 2021). These personalized pathways facilitate targeted skill acquisition, thereby optimizing resource allocation within organizations. Moreover, AI provides predictive analytics that enable organizations to identify future workforce needs and potential skill gaps (Mustafa, Mustafa, et al., 2025). By analyzing historical performance data, organizations can forecast changing competencies required in evolving market conditions, thereby aligning training programs accordingly (Bersin, 2018).
b. **Integration of Robotics Knowledge**
   The influence of robotics in HRD is increasingly relevant in the context of AI's integration. As tasks become automated, employees must adapt to interfaces that require interdisciplinary skills blending traditional professional competencies with robotic and AI literacy (Brynjolfsson & McAfee, 2014). Research indicates that fostering familiarity with AI and robotics can enhance workplace adaptability and operational efficiency (Susskind & Susskind, 2015). In addition, organizations investing in the upskilling of employees regarding robotic systems are likely to maintain competitive advantages as they navigate the complexities introduced by increased automation.
c. **Ethical Considerations**
   The integration of AI into HRD raises several ethical concerns, particularly concerning data privacy and algorithmic bias (Akbar, 2024; Mustafa, Ismail, et al., 2025). O'Neil (2016) emphasizes the potential dangers of relying on AI systems that perpetuate existing biases, ultimately leading to inequitable treatment of employees. Additionally, the lack of transparency in AI algorithms contributes to mistrust among employees regarding their performance evaluations and career advancement opportunities (Binns, 2018). Organizations must prioritize ethical framework development and ensure that AI applications are both equitable and transparent, thereby fostering employee trust and engagement.

Future Research Directions. Despite the advancements in AI's application within HRD, there remains a significant need for longitudinal studies that assess the long-term impacts of AI on workforce readiness. Furthermore, exploring employee perceptions of AI-driven HRD practices will offer valuable insights into the socio-cultural implications of these technologies. Future research should also consider developing frameworks that guide the ethical implementation of AI in HRD (Haeruddin, 2025a). The significance of *makkunrai* extends beyond familial roles; these values are also aligned with community expectations, fostering collective identity among Buginese women. The preservation of these values in communal practices, such as traditional ceremonies and rituals, underscores their importance in the cultural fabric of Buginese society.

3. METHOD

This literature review adopts a systematic approach to gather, analyze, and synthesize existing studies on AI's impact on Human Resource Development. A comprehensive search strategy was implemented across multiple academic databases, including Scopus, Google Scholar, and JSTOR, utilizing keywords such as "AI in Human Resource Development," "AI impact on employee training," and "robotics in HRD." Inclusion criteria were established to ensure the relevance and quality of selected studies. Only peer-reviewed journal articles, conference proceedings, and credible industry reports published in the last ten years were included. The final selection comprised studies that examined the applications, challenges, and outcomes of AI in HRD contexts. Data extracted from selected articles were analyzed qualitatively, identifying key themes, trends, and gaps in the literature concerning AI's influence on HRD. By employing a systematic review methodology, this study aims to present a comprehensive overview of the current state of knowledge regarding AI in HRD.

4. RESULT AND DISCUSSION

The result of this study reveals a growing consensus regarding AI's positive contributions to HRD, particularly through enhancing training, performance assessment, and employee participation. Highly personalized training experiences facilitated by AI technologies enable organizations to maximize the effectiveness of their HRD initiatives. Additionally, the use of predictive analytics to anticipate workforce needs has emerged as a significant benefit, empowering organizations to proactively address skills gaps. However, the result of this study also highlights pressing concerns surrounding ethical implications. Algorithmic bias and the lack of transparency in AI systems raise critical questions about fairness and the equitable treatment of employees. Consequently, organizations must be vigilant in their efforts to develop ethical AI frameworks that prioritize fairness, transparency, and accountability.

Implications for Human Resource Development. The implications for HRD practice are substantial. Organizations must invest in AI training for HR professionals to enhance their understanding of these technologies and their ethical implications. This investment will not only foster a more responsible deployment of AI in HRD but also enable HR professionals to advocate for equitable practices in talent management. Furthermore, fostering an organizational culture that encourages continuous learning will empower employees to adapt to the rapid changes introduced by AI, thereby enhancing their resilience and adaptability.

Challenges Ahead. While the benefits of integrating AI into HRD are clear, organizations must navigate the ethical complexities associated with these technologies. Establishing guidelines that promote transparency and accountability is crucial, as is fostering an environment of trust between employees and AI systems. Additionally, navigating the potential skills gap created by the adoption of AI necessitates ongoing training and reskilling initiatives to prepare the workforce adequately.

5. CONCLUSION

The integration of AI into HRD is not merely a technological upgrade; it represents a paradigm shift in how organizations understand and leverage workforce capabilities. This literature review has elucidated several critical dimensions of AI's impact on HRD, identifying both the opportunities it presents and the challenges it poses. As organizations seek to enhance employee skill development and engagement through AI technologies, the implications of these trends must be carefully examined to create effective, equitable, and sustainable workforce strategies.

Transformative Opportunities. AI technologies enhance HRD practices by enabling data-driven decision-making, personalized learning experiences, and efficient performance

assessments. One of the central opportunities presented by AI in HRD is the capacity for tailored training programs. Traditional training methods often take a one-size-fits-all approach, which can lead to inefficiencies and unmet developmental needs. In contrast, AI-driven platforms can analyze individual employee performance data, learning styles, and career progression to recommend personalized training pathways. This individualized approach helps employees develop relevant skills that align with their roles while also preparing them for future responsibilities within the organization. For instance, AI algorithms can identify specific skill gaps within teams or departments by evaluating performance metrics against desirable benchmarks. By leveraging this data, organizations can design focused training interventions that address these gaps proactively. Furthermore, AI platforms can adapt in real-time, refining their recommendations as employees advance, thus ensuring that learning remains relevant and aligned with evolving job requirements. This approach not only maximizes the effectiveness of training but also enhances employee satisfaction and engagement, as individuals feel their unique developmental needs are being acknowledged and addressed.

Predictive Analytics in Workforce Planning. Another significant contribution of AI to HRD is its capabilities in predictive analytics. Organizations increasingly need to anticipate workforce needs in a rapidly changing environment. AI-powered tools allow HR professionals to analyze patterns in employee data, identify trends, and predict future skill requirements. This foresight enables organizations to align their HRD strategies with business objectives, ensuring a more agile and prepared workforce. By understanding the skills that will be required, organizations can implement targeted recruitment strategies and preemptively develop training programs to close potential skill gaps. For example, if AI models indicate that a significant technological shift is on the horizon that will require specific competencies, HR departments can initiate upskilling initiatives ahead of time. This proactive approach minimizes the risk of talent shortages and enhances organizational resilience, allowing companies to pivot quickly in response to market dynamics.

Ethical Implications and Accountability. While the advantages of AI integration into HRD are compelling, they are accompanied by significant ethical considerations that demand attention. As organizations deploy AI systems, they must be cognizant of potential algorithmic biases that can arise from the data on which these systems are trained. Historical data often reflects entrenched biases related to gender, race, and socio-economic status, which can perpetuate inequalities if not adequately addressed. It is crucial for organizations to adopt a critical perspective regarding the data they utilize and the algorithms they implement. Transparency in algorithmic decision-making processes can help build trust with employees, who may otherwise feel uncertain or skeptical about how AI influences their appraisal and development. Implementing a robust ethical framework will be essential to ensure accountability in AI applications. This framework should include guidelines on data privacy, fair treatment, and strategies for mitigating bias in AI algorithms. Organizations can also benefit from involving diverse stakeholders in the development and monitoring of AI systems. By including representatives from various demographics within the workforce, companies can foster an inclusive approach that helps identify and address potential biases within AI technologies. Regular audits and assessments of AI systems can further ensure that they operate equitably and transparently, promoting a culture of trust and engagement.

The Role of Robotics Knowledge. As automation becomes more integrated into various job roles, the interplay between AI and robotics introduces additional complexity in HRD. Employees must cultivate not only technical skills but also cognitive and interpersonal abilities to thrive in increasingly automated environments. Research indicates that fostering proficiency in robotics and AI literacy is becoming essential for workforce

development. Organizations that prioritize training in these areas equip their employees with the necessary tools to navigate new technologies effectively, leading to enhanced job performance and job satisfaction.

Training programs that incorporate a combination of technical skill acquisition and soft skill development can enhance employees' adaptability in the face of change. By aligning training with future needs and operational shifts, organizations can create a workforce that is not only knowledgeable about new technologies but also capable of leveraging these tools for innovative problem-solving and collaboration.

Continuous Learning and Organizational Culture. The successful integration of AI in HRD necessitates fostering a culture of continuous learning within organizations. HR professionals must emphasize ongoing education and skill development as essential components of employee engagement strategies (Haeruddin, 2025b). The rapid pace of technological change underscores the importance of building an organization where learning is not restricted to periodic training sessions but is an integral part of the work experience. Employers should encourage employees to pursue professional development opportunities actively, whether through formal training, mentorship, or peer collaboration. This can be supported by AI-driven platforms that recommend learning opportunities based on individual goals, career paths, and organizational needs. By prioritizing lifelong learning, organizations can cultivate a workforce that remains agile and capable of meeting emerging challenges.

The Future of HRD with AI. Looking ahead, the collaboration between AI technologies and HRD practices is likely to evolve further. As AI becomes more sophisticated, its applications in HRD will expand, prompting organizations to reassess their strategies and frameworks continually. This dynamic environment requires HR professionals to cultivate a mindset that embraces innovation while remaining grounded in ethical considerations. Future research is essential to explore the long-term implications of AI integration on organizational culture, employee satisfaction, and overall performance. As AI technologies continue to evolve, it will be crucial to understand how they reshape the employee experience and influence workplace dynamics. Organizations should remain proactive in engaging with new developments in AI and robotics, adjusting their HRD strategies accordingly. Interdisciplinary collaboration among technologists, educators, and HR practitioners can further enhance understanding and implementation of effective AI-driven HR strategies.

In conclusion, this literature review underscores the profound impact of AI on Human Resource Development. While AI offers transformative opportunities for enhancing training, workforce engagement, and predictive analytics in HRD, it also presents significant ethical challenges that must be addressed. As organizations strive to harness the potential of AI to shape their HRD practices, they must prioritize transparency, accountability, and inclusivity in their approaches. By fostering a culture of continuous learning and adaptation, organizations can prepare their workforces for the future, balancing technological advancements with human-centric development strategies. Ultimately, understanding and addressing the complexities associated with AI integration will be crucial for organizations aiming to succeed in an increasingly digital and competitive landscape.

REFERENCES

Akbar, A., Idris, M. Ma'ruf, Kurniawan, A. Widhi, Mustafa, M. Yushar, Natsir, U. Darmawan, Angreyani, A. Dewi. (2024). The Resource-Based View in the Asta Brata and Organisational Performance: A Moderating Approach of Adaptability and Innovation. *Journal of Economics and Trade*, *9*(2), 50-57. https://doi.org/https://doi.org/10.56557/jet/2024/v9i29034

Akbar, A., Mustafa, M. Y., Haeruddin, M. I. M., Mariñas-Acosta, C., Hasbiyadi, H., Alam, S., & Darmawinata, W. N. S. (2024). Days of future past: Scrutinising the artificial intelligence impact on the leadership of internationalising SMEs. *Asian Journal of Economics, Business and Accounting*, *24*(5), 53-59. https://doi.org/https://doi.org/10.9734/ajeba/2024/v24i51292

Amran, A. D., Syahid, R., & Mustafa, M. Y. (2024). Digital Leadership Impacts on a Village-owned Enterprise Performance: A Moderation Effect of Artificial Intelligence. *South Asian Journal of Social Studies and Economics*, *21*(11), 74-80. https://doi.org/https://dx.doi.org/10.9734/sajsse/2024/v21i11902

Bersin, J. (2018). AI, machine learning, and the future of HR. Harvard Business Review. Retrieved from https://hbr.org

Binns, R. (2018). Fairness in Machine Learning: Lessons from Political Philosophy. Proceedings of the 2018 Conference on Fairness, Accountability, and Transparency, 149-158.

Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company.

Gupta, P., Lakhera, G., & Sharma, M. (2024). Examining the impact of artificial intelligence on employee performance in the digital era: An analysis and future research direction. *The Journal of High Technology Management Research*, *35*(2), 100520. https://doi.org/https://doi.org/10.1016/j.hitech.2024.100520

Hajiali, I., Kessi, A. M. F., Budiandriani, B., Prihatin, E., & Sufri, M. M. (2022). Determination of work motivation, leadership style, employee competence on job satisfaction and employee performance. *Golden Ratio of Human Resource Management*, *2*(1), 57-69.

Haeruddin, M. I. M. (2025a). The Role of Artificial Intelligence on Employee Performance: A Literature Study. Southeast Asia Journal of Business, Accounting, and Entrepreneurship, 3(1-3), 12-15. https://dailymakassar.id/ejournal/index.php/sains/article/view/123

Haeruddin, M. I. M. (2025b). Employee Perceptions of Green HRM Practices: A Qualitative Study in Makassar's Manufacturing Sector. Journal Management & Economics Review (JUMPER), 2(7), 235–242. https://doi.org/10.59971/jumper.v2i7.613

Huu, P. T. (2023). Impact of employee digital competence on the relationship between digital autonomy and innovative work behavior: a systematic review. *Artificial Intelligence Review*, *56*(12), 14193-14222.

Kumar, S., & Rema, S. (2021). Transforming Human Resource Development Through Artificial Intelligence. International Journal of Human Resource Studies, 11(1), 69-82.

Mustafa, M. Y., Ismail, M. D., Haeruddin, M. I. M., Natsir, U. D., Idris, M. M., Akbar, A., & Mariñas-Acosta, C. (2025). Age of Ultron: Exploring the Transformational Leadership Influence on Marketing Innovation of SMEs (An Investigation Based on the 4I Model of Burns). *Southeast Asia Journal of Business, Accounting, and Entrepreneurship*, *3*(1), **7-11**.

Mustafa, M. Y., Mustafa, R., Haeruddin, M. I. M., & Putra, M. A. F. A. (2025). The Skywalker Saga: A Bibliometric Analysis on Product Innovation in the Era of Artificial Intelligence. *Southeast Asia Journal of Business, Accounting, and Entrepreneurship*, *3*(1-3), 20-36.

O'Neil, C. (2016). Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy. Crown Publishing Group.

Palupiningtyas, D., Octafian, R., Mistriani, N., Ayunda, K. N., & Putra, M. A. (2025). The effect of GHRM on young employee retention and performance: Evidence from Indonesia. *SA Journal of Human Resource Management*, *23*, 2886.

Susskind, R., & Susskind, D. (2015). The Future of the Professions: How Technology Will Transform the Work of Human Experts. Harvard University Press.