

The Role of AI-Driven Human Resource Information Systems (HRIS) in Enhancing Employee Performance and Organizational Agility: Evidence from Industry 5.0

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Informasi

Abstract

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The rapid advancement of Artificial Intelligence (AI) has significantly transformed Human Resource Information Systems (HRIS), enabling organizations to improve workforce management through intelligent automation, predictive analytics, and data-driven decision-making. In the context of Industry 5.0, organizations are encouraged to integrate advanced digital technologies while maintaining a human-centered approach that emphasizes employee well-being, innovation, and organizational resilience. This study aims to explore the role of AI-driven Human Resource Information Systems (HRIS) in enhancing employee performance and organizational agility. A qualitative case study approach was employed to obtain an in-depth understanding of AI implementation in human resource management. Data were collected through semi-structured interviews, organizational documents, and a review of recent literature, and were analyzed using thematic analysis. The findings indicate that AI-driven HRIS improves employee performance by supporting more accurate recruitment, personalized learning and development, efficient performance evaluation, and evidence-based managerial decision-making. Furthermore, AI-supported HRIS enhances organizational agility by strengthening strategic workforce planning, accelerating organizational responses to environmental changes, and improving adaptability in dynamic business environments. However, the successful implementation of AI-driven HRIS depends on organizational readiness, employee digital competencies, ethical AI governance, and leadership commitment. This study contributes to the Human Resource Management literature by providing insights into the integration of AI-driven HRIS within the Industry 5.0 framework and offers practical recommendations for organizations seeking sustainable digital transformation through intelligent human resource management.

Keyword: Artificial Intelligence, Human Resource Information Systems, Employee Performance, Organizational Agility, Industry 5.0

A. INTRODUCTION

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) has fundamentally transformed how organizations manage their workforce in the digital era. AI technologies are increasingly embedded within Human Resource Information Systems (HRIS), enabling organizations to automate administrative tasks, analyze workforce data, predict employee needs, and support strategic decision-making. According to Margherita (2022), AI has shifted HRM from an administrative function to a strategic business partner capable of creating organizational value through intelligent decision support. Similarly, Vrontis et al. (2022) argue that AI-driven HR technologies enhance organizational efficiency by improving recruitment, talent management, employee development, and performance evaluation processes. Consequently, AI-driven HRIS has become one of the most significant technological innovations supporting sustainable human resource management.

The emergence of Industry 5.0 has expanded the role of AI beyond mere technological efficiency by emphasizing human-centered innovation, sustainability, and organizational resilience. Unlike Industry 4.0, which primarily focused on automation and productivity, Industry 5.0 promotes collaboration between intelligent technologies and human capabilities to create long-term organizational value (European Commission, 2021). Longo et al. (2020) emphasized that advanced technologies should complement, rather than replace, human creativity, while Breque et al. (2021) highlighted that organizations implementing Industry 5.0 principles are expected to prioritize employee well-being alongside technological advancement. Therefore, AI-driven HRIS should not only enhance operational efficiency but also strengthen employee engagement, organizational learning, and adaptive capacity.

Employee performance and organizational agility have become critical determinants of competitiveness in today's dynamic business environment. Rapid technological advancements, digital transformation, and global market uncertainties require organizations to respond swiftly while maintaining high levels of employee performance. AI-supported Human Resource Information Systems (HRIS) provide organizations with predictive workforce analytics, intelligent performance management, and personalized learning systems that enable employees to develop relevant competencies and adapt to evolving business demands. Recent studies by Minbaeva (2021) and Chowdhury et al. (2023) have shown that digital HR technologies positively impact employee productivity, innovation capacity, and organizational responsiveness by facilitating evidence-based decision-making and continuous organizational learning.

Despite the increasing adoption of AI in Human Resource Management (HRM), research exploring the strategic impact of AI-driven Human Resource Information Systems (HRIS) on both employee performance and organizational agility within the Industry 5.0 framework remains limited. Most prior studies have concentrated on individual HR functions, such as AI-based recruitment, digital performance appraisal, or workforce analytics, without thoroughly explaining how AI-driven HRIS fosters sustainable organizational capabilities. Moreover, challenges related to ethical AI, employee trust, transparency, and digital readiness continue to hinder successful AI implementation in organizations (Budhwar et al., 2023; Jatobá et al., 2023). Therefore, this study aims to investigate how AI-driven HRIS enhance employee performance and organizational agility while upholding the human-centered principles of Industry 5.0. The findings are expected to advance the strategic HRM literature and offer practical guidance for organizations adopting AI-enabled human resource management systems.

B. RESEARCH METHOD

This study employed a qualitative case study approach to explore the implementation of Artificial Intelligence (AI)-driven Human Resource Information Systems (HRIS) in enhancing employee performance and organizational agility within the Industry 5.0 framework. A qualitative approach was deemed appropriate because it provides an in-depth understanding of organizational experiences, perceptions, and practices related to AI adoption in human resource management (Creswell & Poth, 2018). The study focused on organizations that have implemented AI-supported HRIS in their human resource functions, including recruitment, employee performance evaluation, learning and development, and workforce analytics. Data were collected through semi-structured interviews with HRIS managers and employees, organizational documents, and relevant literature to ensure data triangulation and enhance the credibility of the findings (Yin, 2018).

The collected data were analyzed using thematic analysis, following the procedures proposed by Braun and Clarke (2021). These procedures included data familiarization, initial coding, theme identification, theme review, theme definition, and interpretation. The trustworthiness of the findings was ensured through credibility, transferability, dependability, and confirmability by comparing information obtained from multiple data sources and validating the emerging themes (Lincoln & Guba, 1985; Creswell & Poth, 2018). This analytical approach enabled the researchers to identify key themes describing how AI-driven HRIS contributes to employee performance and organizational agility within the context of Industry

5.0.

C. RESULTS AND DISCUSSION

3.1 AI-Driven Human Resource Information Systems as a Strategic Human Resource Tool

The findings indicate that AI-driven Human Resource Information Systems (HRIS) have evolved from conventional administrative tools into strategic platforms that support organizational decision-making. Participants reported that AI technologies significantly reduced the time required to perform routine HRIS activities such as recruitment screening, employee data management, attendance monitoring, and performance documentation. These improvements enabled HRIS professionals to focus more on strategic tasks, including talent development, workforce planning, and employee engagement. This finding aligns with Margherita (2022), who argued that AI has transformed HRIS into a strategic organizational resource capable of enhancing the effectiveness of human resource management.

Interview data also revealed that AI-supported HRIS improves the quality of managerial decision-making by providing real-time workforce information and predictive analytics. HARI managers explained that AI systems enable organizations to identify competency gaps, forecast workforce demands, and recommend suitable employee development programs based on organizational needs. Consequently, HARI decisions become more objective, evidence-based, and responsive to organizational changes. Similar findings were reported by Vrontis et al. (2022), who emphasized that AI enhances strategic HARI decision-making by delivering accurate workforce intelligence and supporting organizational competitiveness.

Another important finding concerns the contribution of AI-driven HRIS to organizational learning. Participants highlighted that intelligent HRIS systems facilitate personalized learning pathways by recommending training programs based on employee competencies, job performance, and career aspirations. Employees perceived these recommendations as more relevant than traditional training programs because they addressed individual learning needs. According to Minbaeva (2021), AI technologies support continuous organizational learning by enabling personalized knowledge development and enhancing workforce adaptability in rapidly changing business environments.

Furthermore, the implementation of AI-driven Human Resource Information Systems (HRIS) supports the human-centered principles advocated by Industry 5.0. Rather than replacing employees, AI technologies are primarily utilized to assist them in completing routine tasks, reducing administrative burdens, and enhancing collaboration between managers and

staff. Participants emphasized that successful AI implementation depends not only on technological capability but also on leadership commitment, employee digital competence, organizational culture, and ethical governance. These findings align with the Industry 5.0 perspective proposed by the European Commission (2021), which stresses that technological innovation should enhance human capabilities while promoting sustainability, resilience, and employee well-being.

3.2 AI-Driven Human Resource Information Systems in Enhancing Employee Performance

The findings demonstrate that AI-driven Human Resource Information Systems (HRIS) significantly enhance employee performance by optimizing various human resource management functions. Participants noted that AI-supported HRIS simplifies recruitment, onboarding, performance appraisal, and employee development through intelligent automation and real-time data analysis. These technologies reduce administrative workloads, allowing employees to focus on value-added activities that require creativity, collaboration, and problem-solving. According to Chowdhury et al. (2023), AI technologies improve employee productivity by automating repetitive tasks and providing data-driven insights that support better work performance. Similarly, Budhwar et al. (2023) stated that AI enables organizations to implement more efficient and employee-oriented HRIS practices.

Another important finding is that AI-driven Human Resource Information Systems (HRIS) facilitate personalized employee development through adaptive learning systems. Interview participants indicated that AI applications recommend training programs based on employees' competencies, previous performance records, and future career aspirations. These personalized recommendations enable employees to continuously enhance their knowledge and skills in alignment with organizational requirements. This finding aligns with Minbaeva (2021), who emphasized that AI enhances organizational learning by delivering individualized learning experiences and promoting continuous capability development. Furthermore, Margherita (2022) argued that AI-driven learning systems strengthen employee competencies and improve long-term organizational performance.

Participants also reported that AI-supported performance management systems enhance fairness and transparency in employee evaluations. Instead of relying solely on supervisors' subjective judgments, AI-driven HRIS integrates multiple performance indicators, including productivity, attendance, competency development, collaboration, and goal achievement. The availability of comprehensive workforce data enables managers to conduct more objective and

evidence-based performance evaluations. As noted by Vrontis et al. (2022), AI-based performance management systems improve decision accuracy while reducing potential bias in employee assessment processes. Consequently, employees perceive organizational performance evaluations as more transparent and equitable.

Despite these advantages, the findings reveal that the effectiveness of AI-driven HRIS depends on employees' readiness to adopt digital technologies. Several participants acknowledged that limited digital literacy and concerns regarding data privacy remain significant challenges during AI implementation. Therefore, organizations should complement technological investments with continuous digital skills training, transparent communication, and ethical AI governance to build employee trust and acceptance. These findings support the arguments of Jatobá et al. (2023), who emphasized that successful AI adoption requires balancing technological innovation with human values, organizational ethics, and employee participation to achieve sustainable human resource management.

3.3 AI-Driven Human Resource Information Systems and Organizational Agility in the Industry 5.0 Era

The findings reveal that AI-driven Human Resource Information Systems (HRIS) play a crucial role in enhancing organizational agility by enabling organizations to respond more effectively to rapidly changing business environments. Participants noted that AI-supported workforce analytics provide real-time information on employee competencies, workforce availability, and organizational performance, allowing managers to make faster and more accurate strategic decisions. These capabilities improve organizational responsiveness to technological disruptions and market uncertainties. According to Teece (2018), organizational agility depends on the ability to sense environmental changes, seize emerging opportunities, and continuously transform organizational resources. Similarly, Nyamboga et al. (2025) argue that AI-driven HRIS technologies significantly enhance organizational adaptability through intelligent workforce management.

Another important finding indicates that AI-driven HRIS supports organizational resilience by enhancing strategic workforce planning. Interview participants emphasized that predictive analytics embedded within AI systems enable organizations to anticipate future workforce demands, identify critical skill shortages, and design appropriate talent development strategies before organizational challenges arise. Such proactive workforce planning minimizes operational risks and improves organizational preparedness for future uncertainties. These findings align with Budhwar et al. (2023), who reported that AI-supported

HRIS improve organizational resilience by enabling evidence-based planning and more effective resource allocation.

The study also found that AI-driven HRIS enhances collaboration and communication across organizational units. Participants reported that digital HRIS platforms facilitate information sharing, performance monitoring, and coordination between managers and employees, regardless of geographical location. These digital capabilities have become particularly valuable in hybrid and remote work environments, where organizations require flexible communication systems to maintain productivity and employee engagement. According to Vrontis et al. (2022), digital HRIS technologies improve organizational flexibility by enhancing collaboration, accelerating information exchange, and supporting continuous organizational learning. Furthermore, Longo et al. (2020) emphasized that Industry 5.0 encourages organizations to integrate intelligent technologies while maintaining human collaboration as the foundation of sustainable organizational performance.

Despite the strategic benefits identified, participants acknowledged that achieving organizational agility through AI-driven HRIS requires continuous investment in technology, strong leadership commitment, employee digital competencies, and ethical AI governance. Organizations must ensure that AI applications remain transparent, fair, and aligned with organizational values to maintain employee trust and acceptance. Therefore, AI should be regarded as a complementary tool that enhances human capabilities rather than replacing employees. This finding supports the Industry 5.0 principles proposed by the European Commission (2021), which emphasize that sustainable digital transformation should balance technological advancement with human well-being, resilience, and long-term organizational sustainability.

D. CONCLUSION

This study examined the role of AI-driven Human Resource Information Systems (HRIS) in enhancing employee performance and organizational agility within the Industry 5.0 framework. The findings indicate that AI-supported HRIS has evolved into a strategic organizational resource that improves recruitment processes, employee development, performance management, and workforce planning through intelligent automation and data-driven decision-making. The implementation of AI-driven HRIS also contributes to organizational agility by enabling faster strategic responses, enhancing workforce adaptability, strengthening collaboration, and supporting sustainable organizational development. These

results demonstrate that AI technologies can enhance organizational competitiveness when integrated with human-centered management practices.

From a practical perspective, organizations should prioritize the development of employees' digital competencies, ethical AI governance, leadership support, and continuous organizational learning to maximize the benefits of AI-driven HRIS. Rather than replacing human capabilities, AI should function as a strategic partner that empowers employees and supports better organizational decision-making. Future research is encouraged to investigate AI-driven HRIS across different industrial sectors and cultural contexts, as well as to examine additional variables such as employee trust, digital leadership, organizational innovation, and technology acceptance to enrich the literature on Human Resource Management in the Industry 5.0 era.

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