



AI-Based Human Resource Management Information System Design To Improve Organization Agility Presenting Society 5.0

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Abstract

This study aims to design an Artificial Intelligence (AI)-based Human Resource Management Information System (HRMIS) to enhance organizational agility in supporting the implementation of Society 5.0. The study employed a **library research** method with a descriptive qualitative approach by analyzing relevant books, scientific journals, and academic publications related to human resource management, management information systems, artificial intelligence, and Society 5.0. The findings indicate that integrating AI into an HRMIS can optimize recruitment processes, employee data management, performance evaluation, competency mapping, training recommendations, and real-time decision support. Furthermore, the proposed system enhances the efficiency and effectiveness of human resource management while enabling organizations to respond more quickly and adaptively to dynamic environmental changes. Consequently, an AI-based HRMIS serves as a strategic solution for fostering organizational agility and supporting the realization of a human-centered, innovative, and sustainable Society 5.0.

Keyword: *human resource management information system, artificial intelligence, organization agility, social 5.0, digital transformation.*

A. INTRODUCTION

The development of information and communication technology has brought fundamental changes to organizational governance across various sectors, both public and private. The Industrial Revolution 4.0, characterized by the use of digital technologies such as the Internet of Things (IoT), Big Data, Cloud Computing, Artificial Intelligence (AI), and Machine Learning, has shifted the organizational paradigm from conventional work systems to data-driven work systems. These changes not only affect organizational operations but also impact decision-making patterns, human resource (HR) management, business strategies, and organizational work culture. Organizations that are unable to adapt to technological changes will face various challenges such as low productivity, weak competitiveness, and an inability

to respond to rapid and dynamic environmental changes.¹

Amidst these developments, the concept of Society 5.0, first introduced by the Japanese Government, offers a new paradigm in building a human-centered society. Unlike the Industrial Revolution 4.0, which emphasized technological advancement, Society 5.0 positions technology as an instrument to improve the quality of human life through the integration of physical space and cyberspace. Artificial Intelligence is one of the key technologies that enables fast, accurate, and adaptive data analysis processes, thereby assisting humans in producing more effective decisions. Thus, the existence of AI is not intended to replace the role of humans, but rather to become a strategic partner in improving the efficiency, effectiveness, and quality of decision-making in various areas of life, including in human resource management.

Indonesia, as a country undergoing digital transformation, is encouraging the use of digital technology through various national policies. Digital transformation is one of the government's strategic agendas to realize modern, adaptive governance and organizations that are capable of competing globally. The use of digital technology is also part of the effort to realize the vision of Golden Indonesia 2045, which emphasizes the importance of developing superior human resources as the primary capital for national development. Therefore, organizations are required not only to develop technological infrastructure but also to build HR management systems that can adapt to technological developments and changing organizational needs.²

Human resources are a strategic asset that determines the success of an organization. Various studies have shown that the success of technology implementation is determined not only by the sophistication of the system used, but also by the quality of the human resource management that supports it. Human resources are no longer viewed solely as a factor of production, but as human capital possessing knowledge, competence, creativity, and the ability to adapt to change. In this context, the function of human resource management is transforming from an administrative activity to a strategic function oriented towards value creation for the organization.

However, reality shows that many organizations still manage their human resources

¹ Ridho Alfi Fajar Hidayat et al., "Efektivitas Manajemen Risiko Sumber Daya Manusia Dalam Menghadapi Risiko Keamanan Data Karyawan Di Sektor Teknologi," *Manajemen Kreatif Jurnal* 3, no. 1 (2024): 01–09, <https://doi.org/10.55606/makreju.v3i1.3557>.

² Fahmi Rizal and Zahara Tussoleha Rony, "Strategi Inovatif Dalam Pengelolaan Sumber Daya Manusia: Meningkatkan Kinerja Organisasi Di Era Digital," *Jurnal Ekonomi Manajemen Sistem Informasi* 5, no. 3 (2024).

using conventional systems. Recruitment, performance appraisals, competency development, personnel administration, and career planning processes are still carried out manually or using stand-alone applications. This situation results in HR data being scattered across various platforms, difficult to integrate, requiring lengthy information processing times, and potentially leading to administrative errors. Furthermore, the limitations of conventional systems also make it difficult for organizational leaders to obtain real-time information to support strategic decision-making.

These issues become increasingly complex when organizations are faced with rapidly changing environments. Regulatory changes, technological developments, market dynamics, changing workforce characteristics, and rising societal expectations require organizations to have the ability to adapt quickly. In modern management science, an organization's ability to respond effectively to change is known as organizational agility. Organizational agility is the ability of an organization to detect environmental changes, respond quickly to challenges, and innovate continuously without losing operational effectiveness. Organizations with a high level of agility tend to be more competitive than those still using traditional management systems.

Organizational agility cannot be achieved solely through structural changes or individual competency enhancement. Agility requires the support of an information system capable of providing information quickly, accurately, in an integrated manner, and easily accessible to all stakeholders. In the context of HR management, a management information system is a crucial instrument for integrating all HR business processes, from employee needs planning and recruitment, employee data management, performance evaluation, competency development, and leadership succession planning. When combined with Artificial Intelligence technology, HR management processes can be conducted more intelligently (intelligent system), predictively, and adaptively to changing organizational needs.³

Artificial Intelligence offers a range of capabilities previously difficult to achieve with conventional information systems. AI can analyze large amounts of data (big data analytics), predict future workforce needs, identify employee competencies based on performance track records, provide tailored training recommendations, detect potential employee turnover risks,

³ Sri Mulyati and Nurfauziah, "Pengaruh Penerapan Manajemen Risiko Terhadap Kinerja Keuangan (Studi Pada Bank Umum Kelompok Usaha)," *Jurnal Kebijakan Ekonomi Dan Keuangan*, August 6, 2024, 51–59, <https://doi.org/10.20885/JKEK.vol3.iss1.art7>.

and even assist in the recruitment process by automatically screening candidates based on the competencies required by the organization. Thus, AI functions not only as a tool for automating administrative work but also as a technology capable of generating data-driven decision-making.⁴

However, the implementation of Artificial Intelligence in HR management systems still faces various challenges. One of the main challenges is the organization's readiness to integrate technology with existing business processes. Many organizations have adopted digital technology but have not been able to optimize its use due to limited infrastructure, poor data quality, limited employee digital competency, and the lack of information system design that meets organizational needs. This situation demonstrates that digital transformation is not simply a matter of technology procurement, but also concerns the organization's readiness to implement changes in work culture, governance, and HR management as a whole.

On the other hand, the development of AI also raises various ethical and legal issues that cannot be ignored. The use of algorithms in recruitment processes and performance assessments has the potential to create bias if the data used is not representative. Furthermore, the management of employee personal data must adhere to the principles of data protection, transparency, accountability, and information security. Therefore, the design of an AI-based HR management information system must not only focus on technical aspects but must also consider ethical dimensions, governance, and the protection of employee rights to ensure its implementation remains aligned with the principles of good governance and human-centered technology, which are the main characteristics of Society 5.0.

Based on this description, it is clear that the development of Artificial Intelligence technology has opened up significant opportunities for organizations to improve the effectiveness of human resource management. However, the success of this transformation depends heavily on the organization's ability to design an integrated, adaptive HR management information system that can generate strategic information quickly and accurately. Therefore, developing an AI-based HR management information system is becoming an increasingly urgent need as a foundation for building an agile, innovative organization that is ready to face the challenges of Society 5.0.⁵

⁴ priyono and marnis, *Manajemen Sumber Daya Manusia* (zifatama publisher, 2008).

⁵ muhammad hasbi nasution, "Telaah Kritis Berbagai Risiko SDM Dalam Mempertahankan Kelangsungan Perusahaan," *Jurnal Bonanza Manajemen Dan Bisnis*, 2020.

B. RESEARCH METHOD

This study uses a Research and Development (R&D) method with a qualitative descriptive approach. The R&D method was chosen because this study aims to produce a product in the form of a Human Resource Management Information System (HRMS) design based on Artificial Intelligence (AI) that can be a solution to HR management problems in increasing organizational agility towards Society 5.0. A qualitative descriptive approach is used to gain a comprehensive understanding of the current state of HR management, identify user requirements, analyze weaknesses in existing systems, and formulate a system design that suits the organization's need. 5.0⁶.

C. RESULTS AND DISCUSSION

Transformation of human resource management in the era of society 5.0

The results of the literature review indicate that the development of digital technology has shifted the paradigm of human resource management from a conventional administrative system to a data-driven human resource management system. This change is influenced by the increasingly rapid development of Artificial Intelligence (AI), Big Data, the Internet of Things (IoT), Cloud Computing, and other digital technologies that are the main characteristics of the Industrial Revolution 4.0. However, the concept of Society 5.0 expands the orientation of technology utilization by placing humans at the center of the entire digital transformation process. Thus, technology is no longer positioned as an end in itself, but rather as an instrument to improve the quality of life, organizational productivity, and human well-being.⁷

Various literature explains that the current function of HR management is not only limited to personnel administration, but has evolved into a strategic function that plays a role in creating an organization's competitive advantage. Modern HR management requires organizations to be able to integrate technology with business processes so that decisions are no longer solely dependent on intuition but are based on accurate data analysis. Therefore, the existence of an HR Management Information System is one of the primary needs of organizations in facing increasingly complex environmental dynamics.

⁶ muhammad hasan, *Metode Penelitian Kualitatif* (tahta media grub, 2022).

⁷ Danty Amira, "PENGARUH MOTIVASI KERJA, MANAJEMEN WAKTU, DAN STRES KERJA TERHADAP KINERJA PEKERJA PARUH WAKTU YANG BERSTATUS MAHASISWA DI KOTA MALANG," *Jurnal Ilmiah Mahasiswa FEB*, no. Vol 7, No 1: Semester Ganjil 2018/2019 (2018), <https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/5387/4734>.

A review of various previous studies also shows that digitizing HR management has a positive impact on operational efficiency, service speed, administrative transparency, and decision-making accuracy. However, most HR information systems used by organizations still function primarily as data storage and have not yet optimized AI-based analytical capabilities. This situation highlights the need to develop information systems that are not merely administrative but also capable of generating strategic recommendations for the organization.⁸

Analysis of needs for designing an ai-based human resource management information system

Based on a synthesis of various literature, organizations' needs for HR management information systems have undergone significant changes. Organizations no longer simply require systems capable of storing employee data, but rather systems capable of processing data into strategic information for decision-making.⁹

A study of various Human Resource Information System (HRIS) models shows that several key components must be present in a modern HR information system: employee data management, digital recruitment, performance assessment, competency development, training management, career planning, productivity analysis, and an information dashboard for management. When all these components are integrated with Artificial Intelligence technology, the system will be capable of performing predictive analysis, providing policy recommendations, and supporting automated decision-making.

Literature on AI in Human Resource Management also shows that this technology can improve the effectiveness of the recruitment process by screening candidates based on specific competencies, experience, and characteristics. Furthermore, AI can be used to map employee training needs based on performance evaluation results, thus more effectively targeting competency development programs.

The study also showed that the use of AI enables organizations to predict potential employee turnover, future workforce needs, and potential productivity declines. This predictive capability is one of AI's key advantages over conventional information systems, which only produce administrative reports.

Based on the analysis of various previous concepts and research, a conceptual design of

⁸ Muhammad Asir et al., "Peran Manajemen Risiko Dalam Meningkatkan Kinerja Perusahaan: Studi Manajemen Sumber Daya Manusia," *Entrepreneurship Bisnis Manajemen Akuntansi (E-BISMA)*, June 4, 2023, 32–42, <https://doi.org/10.37631/ebisma.v4i1.844>.

⁹ Ridho Alfi Fajar Hidayat et al., "Efektivitas Manajemen Risiko Sumber Daya Manusia Dalam Menghadapi Risiko Keamanan Data Karyawan Di Sektor Teknologi," *Manajemen Kreatif Jurnal* 3, no. 1 (2024): 01–09, <https://doi.org/10.55606/makreju.v3i1.3557>.

an AI-based HR Management Information System was obtained which consists of several main modules.¹

The first module is **Employee Database Management** , a system that integrates all employee data into a single, centralized database. Data integration allows organizations to quickly access information without the need for manual data processing.

The second module is **Smart Recruitment** , a recruitment system that utilizes Artificial Intelligence algorithms to screen candidates based on competency, work experience, certifications, and job requirements. This module reduces subjectivity in the selection process and increases recruitment efficiency. The third module is **Performance Analytics** , a system that analyzes employee performance based on indicators established by the organization. The AI then generates recommendations regarding employees who need coaching, promotions, or rewards.

The fourth module is Competency Mapping , an automated employee competency mapping system based on educational history, training, certifications, and performance evaluation results. This information forms the basis for developing HR development programs. Next, there's the Learning Recommendation System , which provides personalized training recommendations tailored to each employee's needs. This concept aligns with the lifelong learning principle that is a hallmark of Society 5.0. The system design is also equipped with an Executive Dashboard that displays various strategic information in the form of data visualization so that organizational leaders can monitor HR conditions in real time.

The analysis shows that the implementation of AI in HR Management Information Systems is closely linked to increased organizational agility. Organizational agility is an organization's ability to respond to environmental changes quickly, accurately, and adaptively.

Literature shows that organizations with integrated information systems more easily implement strategic changes because all information is available in real time. The speed of information acquisition allows leaders to make decisions based on the organization's actual conditions.

AI also enables organizations to perform predictive analysis on various potential risks. For example, the system can identify employees who are likely to resign based on changes in attendance patterns, productivity, or job satisfaction levels. This information allows

¹ Wahyu Yuda Pradana et al., "Peran Sumber Daya Manusia Dan Strategi Meminimalkan Risiko Untuk Meningkatkan Kinerja Perusahaan," *JURNAL RUMPUN MANAJEMEN DAN EKONOMI* 2, no. 1 (2025): 335–44, <https://doi.org/10.61722/jrme.v2i1.3721>.

organizations to take preemptive action before problems escalate.

Furthermore, AI supports a more innovative organizational culture because various administrative decisions can be automated, freeing up time for employees to innovate and develop the organization. Thus, the use of AI not only improves administrative efficiency but also strengthens an organization's ability to navigate a dynamic environment.

D. CONCLUSION

Based on the results of the literature research that has been conducted, it can be concluded that the development of Artificial Intelligence (AI) has brought a fundamental shift in the paradigm of human resource management from an administrative system to a strategic, integrated, and data-driven system. In the context of Society 5.0, the application of AI in HR Management Information Systems is not intended to replace the role of humans, but rather as a supporting technology that can improve the quality of decision-making, operational efficiency, and the effectiveness of human resource management

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