



Implementation of *Artificial Intelligence* (AI) in Human Resource Management: A Literature Review

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Abstract: *This research aims to examine in depth the impact of Artificial Intelligence (AI) implementation on the human resource management process. This research was conducted through a literature review by collecting information from reputable journal articles, through descriptive research methods and qualitative approaches. Data was collected through snowball observation technique with the criteria of Scopus indexed journal articles Q1-Q4 within the last 5 years. Data analysis was conducted through data presentation, data reduction and conclusion. The findings of this study provide deep insight into the complexity of the relationship between Artificial Intelligence and human resource management, AI plays an important role in the human resource management process starting from recruitment, selection, employee training and development, performance appraisal, decision making, determining employee compensation and benefits as well as relationships with customers.*

Keywords: *Artificial Intelligence; Human resource management; Digital transformation*

1. INTRODUCTION

The emergence of digital technology has triggered a transformation in the business landscape, while advances in science and technology have triggered a revolution in global civilization, especially in the industrial sector as the driving force of the world economy. In the past, human resource management only focused on basic personnel administration responsibilities, such as maintaining employee records and ensuring regulatory compliance. However, as the 20th century drew to a close and globalization and increasingly complex business processes took place, a fundamental shift in the role of human resource management occurred. Organizations began to recognize the importance of human resources as a valuable competitive advantage, prompting them to invest in areas such as talent management, leadership development, and cultivating a positive organizational culture (Zhang & Chen, 2023).

Digital transformation has become an urgent need in today's era, especially in the HR field. HR management has undergone significant changes. The presence of digital transformation, which was initially considered only an administrative task, has changed the landscape of various industries. This paradigm shift towards digitalization has not only changed the method of operation but also changed the culture and expectations of the organization. As the digital wave continues to hit the corporate world, the role of *Artificial Intelligence* in HR processes

has become a focal point of discussion and implementation, signaling a significant transformation in the way organizations manage their workforce and HR operations. Digital transformation in HR encompasses the implementation of digital technologies into human resource processes, which fundamentally contribute to organizational capabilities including talent management, performance appraisal, and training and development. (Böhmer & Schinnenburg, 2023) . This implies a cultural shift that requires organizations to continually challenge the status quo, experiment, and adapt to failure. (Kane et al., 2015) This transformation is critical for companies that want to remain competitive in a rapidly evolving business landscape.

Artificial Intelligence (AI) as an integral component of digital transformation, is revolutionizing the human resources sector by automating routine tasks, improving decision-making processes, and personalizing employee experiences. The use of AI in HR contributes to achieving the organization's strategic goals in increasing the organization's competitive advantage (Borges et al., 2021) . Although the integration of AI into HR processes provides many benefits, it also raises concerns regarding data security. Therefore, it is important for companies to navigate this issue ethically and responsibly, ensuring that they remain transparent and prioritize employee well-being while leveraging AI for innovation and efficiency.

Thus, digital transformation is not only changing the way they do business, but also changing the way they create, manage, and deliver value to their employees. The purpose of this literature review is to study how digital transformation affects human resource management, and this study also comprehensively focuses on examining in depth the opportunities for *Artificial Intelligence* in the HR process, this study will provide a broader and deeper understanding of the complex relationship between the application of *Artificial Intelligence technology* in human resource management.

2. LITERATURE REVIEW

Digital Transformation in Human Resource Management

Digital transformation has significantly changed the business landscape, including in the field of human resource management (HRM). Digitalization in HRM allows organizations to increase efficiency, transparency, and accuracy in workforce management . According to Vardarlier (2020), the use of digital-based systems in HRM improves organizational capabilities, including in talent management, performance appraisals, and training and

development. Strohmeier (2020) added that the convergence of digital technology and HRM plays an important role in creating strategic value for organizations.

The Role of Artificial Intelligence (AI) in HR

Artificial Intelligence (AI) is increasingly being applied in HR to automate routine tasks and improve decision-making. Khatri et al. (2020) stated that AI can leverage Big Data to improve organizational efficiency and productivity. In various studies, AI has been shown to play a role in several aspects of HR, such as:

a. Recruitment and Selection

AI helps organizations in the recruitment process by identifying the best candidates based on historical data and machine learning algorithms. Ore & Sposato (2022) highlighted that AI is able to reduce risks in recruitment by objectively analyzing candidate characteristics. In addition, Maity (2019) mentioned that AI can be used to increase selection efficiency with methods such as Asynchronous Video Interview (AVI), which helps reduce bias in recruitment.

b. Training and Development

The implementation of AI in employee training allows companies to create personalized training programs. Sabale & Gomathi (2022) stated that AI helps in creating data-driven training programs, including the use of virtual reality (VR) for training simulations. Malik et al. (2021) added that AI can evaluate the effectiveness of training and match employees with suitable positions based on their competencies.

c. Performance Assessment

AI enables companies to conduct more objective and data-driven performance evaluations. Xin et al. (2022) emphasize that AI helps in setting Key Performance Indicators (KPIs) accurately, ensuring more transparent and less biased evaluations. Kiron & Schrage (2019) show that several large companies, such as Amazon and Facebook, have used AI in performance assessments to improve the accuracy of decision-making.

d. Decision Making

In strategic HR decision-making, AI enables faster and more accurate data analysis. Rodgers et al. (2023) highlighted that AI supports ethical decision-making in HR by providing data-driven recommendations. Radonjić et al. (2024) added that AI can help organizations create more effective strategies based on predictive analysis.

e. Compensation and Benefits

AI also plays a role in compensation and benefits management by providing data-driven recommendations on employee salaries and benefits. Chowdhury et al. (2023) stated that

AI algorithms can consider factors such as skill demand in the market, employee performance, and level of competition to determine optimal compensation.

f. Customer Relations

In terms of customer relations, AI helps organizations understand customer preferences and improve interactions with them. Zhang & Chen (2023) stated that AI is able to transform customer data into insights that can be used to improve customer experience. Borges et al. (2021) added that AI enables automation of customer interactions, increases engagement, and provides more responsive services.

Implications and Challenges of AI Implementation in HR

Although AI brings many benefits to HR, there are some challenges that must be considered. Dwivedi et al. (2021) noted that ethical issues, data security, and transparency in the use of AI are major concerns. In addition, Kane et al. (2015) emphasized the importance of organizational cultural readiness in adopting digital transformation for AI to be implemented effectively.

3. RESEARCH METHODS

The research design used is *a literature study* with a descriptive research type and a qualitative research approach. The data collection method used is snowball observation. In the context of literature studies, snowballing refers to the use of a paper's reference list or citations to the paper to identify additional papers. This method is very useful for expanding systematic literature studies, as it allows the discovery of relevant articles that may not be identified through traditional database searches. The process begins with a few important articles and then uses *backward* and *forward snowballing methods* to identify additional relevant papers through their references and citations (Wohlin, 2014). In this data collection, the selection of journal articles with minimum requirements is indexed by Scopus rate Q1-Q4 and with a maximum time of the last 5 years.

The data analysis methods used are divided into 3 stages: data presentation, data reduction, and conclusions (Miles & Huberman, 1992), as follows:

a. Data Presentation

Data presentation is a structured representation of all information.

b. Data Reduction

Data reduction is the analysis stage that sharpens, classifies, directs and removes redundant data and organizes data so that definite and verifiable conclusions can be drawn.

c. Conclusion.

Drawing conclusions is an effort to interpret the data displayed using the researcher's understanding.

4. RESEARCH RESULT

The results of this writing consist of several articles related to the implementation of Artificial Intelligence in the HR process, as follows:

Data Presentation

Table 1. Literature Review

No.	Reference	Impact of Implementation
1	Artificial Intelligence in Human Resources Management: Challenges and a Path Forward (Tambe et al., 2019)	Recruitment, Training and development & Decision Making
2	Identifying opportunities for Artificial Intelligence in the evolution of training and development practices (Maity, 2019)	Training & Development
3	Impact of Artificial Intelligence on Human Resources (Khatri et al., 2020)	Recruitment, Training and Development
4	Impact of Artificial Intelligence on HR practices in the UAE (Singh & Shaurya, 2021)	Training and Development
5	Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy (Dwivedi et al., 2021)	Customer Relations
6	The strategic use of Artificial Intelligence in the digital era: Systematic literature review and future research directions (Borges et al., 2021)	Decision Making, Customer Relationships and Employee Engagement
7	Impact of Artificial Intelligence on employees working in industry 4.0 led organizations (Malik et al., 2021)	Training and development
8	Artificial Intelligence – challenges and opportunities for international HRM: a review and research agenda (Budhwar et al., 2022)	Recruitment, selection, training & development, compensation and benefits
9	Human resource developments with the touch of Artificial Intelligence : a scale development study (Kambur & Akar, 2022)	Selection, Training & development

10	Opportunities and risks of Artificial Intelligence in recruitment and selection (Ore & Sposato, 2022)	Recruitment
11	Human Resource Artificial Intelligence Implementation and Organizational Performance in Malaysia (Xin et al., 2022)	Training & development, Performance appraisal
12	Role of Artificial Intelligence in Corporate Training and Development (Sabale & Gomathi, 2022)	Training & Development, and Decision Making
13	Unlocking the value of Artificial Intelligence in human resource management through AI capability framework (Chowdhury et al., 2023)	Compensation and Benefits
14	An Artificial Intelligence algorithmic approach to ethical decision-making in human resource management processes (Rodgers et al., 2023)	Decision-making
15	Exploring Human Resource Management Digital Transformation in the Digital Age (Zhang & Chen, 2023)	Customer Relations
16	Artificial Intelligence and HRM: HR managers' perspective on decisiveness and challenges (Radonjić et al., 2024)	Decision-making

Data Reduction

Human Resource Management Transformation

Based on the literature review of 16 existing articles, it can be concluded that this digital transformation has significant implications for the human resource management process. Digital transformation is a cultural change in an organization that involves the use of digital tools to improve services, communication, and stakeholder engagement. The transformation of HR to digital is exemplified by the use of computer systems, telecommunications networks, and interactive electronic media in carrying out its duties. (Vardarlier, 2020) . The transformation of human resource management to digital aims to be data-driven and automated, the convergence of human resource management and technology implies the development and implementation of human resource strategies that are directly based on digital potential and produce corporate excellence to create value for the organization (Strohmeier, 2020) . The widespread adoption of digital technology has caused major changes in organizations that are expected to have a significant impact on the organization's operations and internal processes in particular (Ayoko, 2021) .

Implementation of AI in Human Resource Management

Artificial Intelligence is a specialized stream of computer science that enables or builds intelligence in machines and systems, utilizing available Big Data. *Artificial Intelligence* has played a significant role in human resources, by leveraging the power of Big Data to solve industrial problems, create value for customers and increase productivity for competitive advantage (Khatri et al., 2020) . The implementation of *Artificial Intelligence* in Human Resource Management plays an important role in various processes such as assisting the recruitment process, selection, training and development, performance appraisal, decision making, compensation and benefits and various processes related to customers.

Recruitment

The role of implementing *Artificial Intelligence technology* in human resources, can improve recruitment and selection strategies that are full of risks effectively (Ore & Sposato, 2022) . In recruitment algorithms see which applicant characteristics are associated with better job performance, by assessing each employee based on social media posts, others use simpler data such as the extent to which individuals have updated their LinkedIn profiles (Tambe et al., 2019) . Van Esch et al (2021) , states that AI algorithms can improve the identification of job seeker candidates who are interested in the job and to facilitate communication related to the vacancy.

Selection

Artificial Intelligence is used to some extent in the field of recruitment, with real big data and using intelligent algorithms to identify the recruitment selection process (Zhang & Chen, 2023) . Kambur & Akar (2022) , *Artificial Intelligence* has gamified this process to better determine the intelligence and ability levels of pre-screened candidates through games, many characteristics of candidates to be recruited such as cognitive ability, personality, resilience, emotional intelligence, risk-taking potential, and performance under pressure can be measured. Game-based evaluations can provide a better evaluation process for candidates and organizations with more data and less time. *Artificial Intelligence* can help improve the efficiency of the job interview process, Internet-based interviews with the help of *Asynchronous video interview* (AVIS) systems. These algorithms also enable HR professionals to identify the right profile for a vacant role, eliminating racial, gender, or sexual orientation bias (Maity, 2019) .

Training and Development

Artificial Intelligence has a positive and significant role in the function of human resource training and development (Singh & Shaurya, 2021) . The implementation of this system can

provide convenience in the process of employee training and development in increasing their productivity (Sabale & Gomathi, 2022) . According to Budhwar et al (2022) , This algorithm helps the HR process in evaluating the effectiveness of training and determining employee competencies, which include emotional and intellectual abilities and experience levels, to match employees with the most suitable positions based on their talents. *Artificial Intelligence systems* provide well-designed training programs using the latest tools or technologies such as virtual reality (VR) which are specifically used in developing their employees (Malik et al., 2021) .

Performance assessment

Implementation of *Artificial Intelligence* in the performance management process will help assess the performance of the organization purely based on historical performance data and current performance metrics achievement in conducting bias-free performance reviews, and thereby initiate course corrections that are not appropriate by providing prescriptive recommendations (Xin et al., 2022) . AI algorithms play a vital role in determining what *key performance indicators* (KPIs) to measure, how to measure them, and how best to optimize them . KPIs create accountability for optimizing strategic aspirations. This has been implemented by large companies such as Amazon, Alibaba, Facebook, Uber, and various others (Kiron & Schrage, 2019) .

Decision-making

The role of *Artificial Intelligence* for ethical decision making in human resource management processes provides many opportunities (Rodgers et al., 2023) . Bader & Kaiser (2019) , emphasizes that more accurate decisions are made when algorithms and AI are included in the decision-making process because algorithmic decisions can be presented more quickly, objectively and accurately, unlike the human decision-making process based on experience and intuition. The application of AI in the decision-making process in the HR process can be done in various stages such as understanding and making decisions based on the information collected and creating the right strategy (Radonjić et al., 2024) .

Compensation and Benefits

Artificial Intelligence algorithms are used in considering several heuristics such as, demand for skills and expertise in the market and market prices, current and past employee performance, relevance and importance of skills and expertise to the organization, competitiveness, productivity and dynamism. Therefore, perform data-driven intelligent pay compensation, so that it can recommend automated skill maps for employees, considering input from employees, managers and considering job roles, past learning history in the business team

(Chowdhury et al., 2023) . AI algorithms help identify the conflict between and demand for skills availability discovered through the database, which enables organizational procurement and benefits planning (Pessach et al., 2020) .

Customer Relations

Artificial Intelligence in human resources has several potentials such as seeing customer needs, attitudes and preferences, understanding data from operations, partners and supply chains, natural language processing and sensing capabilities, automating case management and helping organizations improve their response to environmental changes (Dwivedi et al., 2021) . Big data in artificial intelligence systems has a significant role because it can transform information into meaningful formats that can be applied in organizations (Zhang & Chen, 2023) . The strategic use of AI can also improve customer relationships in the dimensions of automation, customer and employee engagement and enable machine-machine communication in the dimensions of new product and service offerings (Borges et al., 2021) .

Discussion

The digital transformation of human resource management involves a complete overhaul of an organization's human resource function. This includes the use of advanced technologies such as AI-based human resource management systems and analytics platforms, which help streamline processes, increase employee engagement, and drive better decision-making. Since these advanced technologies can process large amounts of data in a time that is far beyond human capabilities, AI-based recruitment and selection is also proving to be instrumental in attracting and selecting the most talented workforce in an organization.

Artificial Intelligence can help identify candidates for jobs, show interested candidates and help communicate about job openings. The use of *Artificial Intelligence* also supports decision-making not only helping workers in the recruitment and selection process. These algorithms utilize big data that can help managers find the right candidate for the position and eliminate bias.

In addition, this *Artificial Intelligence system* can help the employee training & development process, as well as decision-making and payroll automation by helping professional human resources handle each employee's payroll. In addition, the sophistication of this system can quickly search for the information needed that can be considered in determining employee compensation and benefits. In addition, variations in the supply and need for skills found based on data sets can help in creating corporate welfare and benefit plans , as well as help in improving customer relations such as communication and others.

5. CONCLUSION

The implementation of *Artificial Intelligence* (AI) into HR has fundamentally transformed the function from an administrative role to a strategic one, improving recruitment, selection, training and development, performance appraisal, decision-making, compensation and benefits and customer relations. AI algorithms improve recruitment and selection by identifying the best candidates and reducing bias, while AI systems support effective training and development by tracking skills gaps and evaluating competencies. AI plays a vital role in determining *key performance indicators* (KPIs) for employee performance assessment. In addition, AI automates payroll and benefits management to ensure appropriate compensation. *Artificial intelligence* also in human resource management has several potentials such as seeing customer needs, attitudes and preferences, understanding data from operations, partners and supply chains.

RECOMMENDATION

Based on the research results above, the recommendation for further researchers is to further deepen the discussion regarding the implementation of *Artificial Intelligence* (AI) in an institution or manufacturing industry, focusing on the role of AI in the human resource management process and also conducting *longitudinal studies*. or a long-term study to assess the impact of AI on HR processes and employee experience over time. This will help in understanding the ongoing impact of AI and further expand the understanding that organizations can use to adapt the right strategies so that their business can continue to grow.

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