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ORIGINAL ARTICLE

The Role and Place of Artificial Intelligence and Machine Learning in Improving Human Resources: Applications and Challenges

Akbar Jadidi Mohammadabadi[1], Foroozan Amosa*[2], Maryam Hosseinzadeh[3]

1. Associate Professor of Educational Sciences, Payame Noor University, Tehran, Iran.
2. Master's Student, Department of Educational Sciences, Tehran, Iran & Teacher at Banu Mehri Mojtahidzadeh School.
3. PhD student in Economics, Department of Economics, Faculty of Management and Economics, Shahid Bahonar University of Kerman, Kerman, Iran.

Correspondence:
Foroozan Amosa
Email:
foooroozaaan7388@gmail.com

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ABSTRACT

The present study proposed to explain the role and position of artificial intelligence and machine learning in human resource management based on existing research evidence. This study was conducted using a systematic review method and based on valid research review frameworks, and related articles were systematically reviewed and classified after screening and analysis. Research findings showed that the use of AI and ML can improve the quality of decision-making, increase productivity, reduce human bias, and enhance employee satisfaction and commitment. Also, analyzing extensive and multidimensional data through intelligent algorithms allows for personalization of human resources processes, improvement of performance evaluation, talent management, and prediction of organizational behaviors. In summary, the ethical and supervised use of artificial intelligence and machine learning can pave the way for strategic and proactive human resources management, and the findings of this research can be used as a basis for organizational policy-making and the design of modern human resources systems.

KEYWORDS

Artificial Intelligence, Machine Learning, Improvement, Human Resources.

Introduction

In every organization, human resources play a key role in the success and achievement of goals, and no organization can provide services or produce products without paying attention to its employees. In order to manage these people in a desirable way, it is necessary to take help from the tools and specialized knowledge of this scientific field. The technology that has affected all fields such as medicine, military, production, etc. for years is artificial intelligence, which includes numerous branches such as robotics, advanced data analysis, image recognition, language recognition, etc. Systematic evolution and digitalization have also affected human resource management and have been one of the main trends in this field in recent years (Brook et al. 2019).

"Artificial intelligence" is a technology that enables machines to perform tasks intelligently and intelligently. The development of AI is a change that has far-reaching implications, especially for fields such as engineering, business, and human resource management (Nankrais et al. 2021). The term "human resource management" (HRM) refers to several activities related to organizational management as well as policies related to human resources. Developing an organizational human resource strategy, selecting and hiring personnel, providing training and development, evaluating employee performance, managing compensation, and managing employee relations are all tasks that fall into this category (Tiwari and Pant, 2020). AI can help HR managers automate routine operations, maintain records and personnel performance, and make more informed decisions through predictive analytics. AI can also help HR managers analyze data and develop more effective procedures. Human resource managers can use AI to reduce the amount of work they have to do, increase productivity, and improve their ability to make decisions about the future of their company. In short, AI is changing the way HR departments operate, and its use will only increase in the near future (Armstrong and Taylor, 2023). Artificial Intelligence (AI) and Machine Learning (ML) in Human Resource Management (HRM) are essential.

Intelligent algorithms, based on artificial intelligence and machine learning, help to solve challenges as well as increase the efficiency (reducing the cost and effort of data analysis and supporting subsequent decision-making) and/or effectiveness (improving the quality of data analysis and supporting subsequent decision-making) of human resources management. IBM and Microsoft use artificial intelligence and machine learning to identify suitable applicants for specific jobs (Castellanos, 2019); This research examines the role and position of artificial intelligence and machine learning in improving human resources, considering its applications and challenges.

Methodology

The present study was conducted as a systematic review. For this purpose, scientific studies published in Scopus, Web of Science, and PubMed databases between 2019 and 2024 were identified. Keywords related to artificial intelligence, machine learning, and human resource management were used. The extracted articles were first screened based on inclusion and exclusion criteria, and then data related to the research objective were extracted. The review and analysis of the findings were conducted based on the review framework of Okoli & Schabram (2010), and the results were presented in the form of systematic tables and graphs to clearly identify the role and position of AI and ML in human resource processes.

Result

Digital transformation and the spread of artificial intelligence and machine learning have moved human resource management from a traditional and reactive approach to intelligent, predictive, and data-driven management. A review of research findings shows that these technologies play complementary and

synergistic roles in four key dimensions—increasing decision-making accuracy, promoting organizational justice, improving employee experience, and predicting organizational behaviors.

Table 1. Research findings

Increasing accuracy in human resources decision-making	Dima (2024)	Reducing human error, increasing accuracy and decision-making, and significantly lowering the hiring error rate in recruiting people.
	Danport and Ronika (2018)	Transition from intuitive decision-making to data-driven decision-making and the complementary role of humans and artificial intelligence
	Nakob et al. (2025)	Reducing human error and cognitive biases
	Vorontis et al. (2022)	Significant reduction of employment decision making error, forecasting and prospective decision making
	Madanchian et al. (2024)	Improving accuracy in recruitment and selection process
	Murogsan (2023)	Increasing the integrity and stability of decisions
Promoting organizational justice	Nakob et al. (2025)	Reducing unconscious biases in recruitment and promotion processes, the role of artificial intelligence in strengthening procedural justice
	Colquit et al. (2023)	The direct effect of organizational justice on organizational commitment, job satisfaction and employee performance
	Dima (2024); Verontis et al. (2022)	Reducing discrimination and bias in recruitment and promotion:
	Fenwick and Raghavan (2024)	Transparency of decisions and increasing employee trust
	Madanchian et al. (2024)	The role and impact of AI in distributive justice
	Morogsan (2023)	Interactive justice and improving employee experience
	Davenport and Ronanki (2018)	Ethical challenges and the necessity of human supervision
Improve employee experience	Moroxan (2023)	Employee sentiment analysis, chatbots, and smart suggesters increase employee satisfaction and engagement, improve internal communication, and responsiveness.
	Morgan (2017)	The concept of employee experience in modern organizations
	Verontis et al. (2022)	Personalization of human resources interactions
	Fenwick and Raghavan (2024)	Sentiment analysis and continuous monitoring of employee experience
	Dima (2024)	The role of AI in improving work-life balance
	Madanchian et al. (2024)	Enhance the learning experience and career growth

	Verontis et al. (2022)	The importance of predicting organizational behaviors
Accurate prediction of organizational behaviors	Dima (2024)	The role of machine learning in analyzing behavioral patterns, ethical considerations in predicting employee behavior
	Madanchian et al. (2024)	Prediction of leaving service and transfer of employees
	Fenwick and Raghavan (2024)	Predicting performance loss and job burnout
	Vorontis (2022)	Anticipation of potential for growth and promotion
	Davenport and Ronanki (2018)	Strategic decision-making based on accurate prediction of organizational behaviors

Discussion

Rather than replacing human labor, artificial intelligence plays a reinforcing role for managers' decision-making. However, limitations such as concerns about data misuse, lack of clear rules, and employee resistance to change have been important challenges so far (Dima, 2024). Artificial intelligence and machine learning have significant potential to transform and improve human resource management. These technologies promote the accuracy, efficiency and personalization of human resources operations by automating and intelligentizing processes in dimensions such as recruitment, performance evaluation, training and compensation. In addition, new research emphasizes that artificial intelligence should not be just a tool to improve productivity, but can play a vital role in promoting the psychological well-being and flourishing of employees (Choudhari et al., 2025). However, to fully realize this potential, organizations must address challenges related to ethics, algorithmic bias, and data privacy.

Successful use of AI requires establishing a clear ethical framework and overcoming employee resistance through training and highlighting its benefits. Artificial intelligence algorithms, like a skilled therapist, can identify each person's strengths and weaknesses by carefully analyzing data and provide personal growth paths that lead to increased job satisfaction and long-term employee commitment. The use of artificial intelligence (AI) and machine learning (ML) in human resource management (HRM) has created a digital transformation and plays a key role in improving processes. Machine learning, as a set of artificial intelligence techniques, is capable of identifying employee behavioral patterns and intelligently enhancing human resource processes by analyzing large amounts of data. Organizations that move faster towards digitization will have a greater competitive advantage. Artificial intelligence and machine learning play a fundamental role in the evolution and improvement of human resources management. These technologies turn human resources into a sustainable competitive advantage for organizations by increasing decision-making accuracy, reducing human biases, promoting organizational justice, improving employee experience, and accurately predicting organizational behaviors.

Conclusions

The findings of this research showed that artificial intelligence and machine learning play a fundamental role in the improvement of human resources and have caused the transition of human resources management from traditional and intuitive approaches to a data-oriented, predictive and intelligent model. The results of the systematic review of studies indicate that these technologies have a significant and synergistic effect in

four key dimensions, i.e., increasing decision-making accuracy, promoting organizational justice, improving employee experience, and accurately predicting organizational behaviors. Intelligent algorithms have significantly increased the accuracy of decisions related to recruitment, performance evaluation, training, retention and succession planning by reducing human errors, identifying hidden patterns, multidimensional data analysis and providing real-time feedback. Also, the standardization of processes and the removal of unconscious biases have led to an increase in perceived justice and organizational trust, and personalization of services, analysis of sentiments and improvement of internal interactions have improved the experience of employees. Finally, the predictive power of ML enables the early identification of key risks such as attrition and burnout and turns human resources into a strategic and forward-looking unit.

These findings are in line with the results of previous researches. For example, Dima (2024) and Vorontis et al. (2022) have shown that AI-based data-driven decision making increases the accuracy and consistency of HR decisions. Nekob et al. (2025) and Colquitt (2013) have also emphasized that the use of standard algorithms strengthens procedural and distributive justice. Also, the results of this study are consistent with the researches of Morogsan (2023) and Morgan (2017) in the field of the role of smart technologies in improving the experience of employees. On the other hand, the findings of Madanchian et al. (2024) and Fenwick and Raghavan (2024) regarding predicting organizational behaviors, leaving service and job burnout also confirm the results of this research. This alignment shows that empirical evidence in international literature emphasizes the transformative role of artificial intelligence in human resource management.

From the author's point of view, the obtained results indicate that artificial intelligence and machine learning are not a substitute for human judgment, but complementary decision-making tools in human resources. Combining machine analysis with human insight can ensure both accuracy and human-centeredness of decisions. However, the full realization of the benefits of these technologies requires serious attention to ethical considerations, transparency of algorithms, privacy and promotion of digital literacy of managers and employees. If organizations can use these technologies with an ethical and supervised approach, artificial intelligence will become a key factor for creating justice, increasing productivity, improving employee experience and achieving sustainable improvement of human resources.

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