2025. Volume 9, Number 1 *Pages 48-55*

UDC: 658.3; 004.8
DOI: https://doi.org/10.30546/2521-6341.2025.01.021

THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCES MANAGEMENT, THEORETICAL PERSPECTIVE

Zamin BABASHOV[1*], Rufat MAMMADOV[2], Huseyin CHICHEK[3]

[1]Baku Engineering University, Economics Department,

[2] Baku Engineering University, Business Administration Department,

Baku, Azerbaijan

[3] Burdur Mehmet Akif Ersoy University, Business Administration Department,

Burdur, Turkiye

ARTICLE INFO

Article history
Received:2025-04-04
Received in revised form:2025-04-21
Accepted:2025-06-20
Available online

Keywords:
Artificial Intelligence
Human Resource Management
Industry 4.0
Bibliometric review

JEL CODES: M54; O33

ABSTRACT

Digitalization is transforming the workplace and the way of doing business in various sectors. Industry 4.0, commonly known as the fourth industrial revolution, has changed the way people work, develop, manage, control, hire and interact with each other. Indeed, we are witnessing a change in the nature of jobs. Today, muscle jobs are disappearing and brain jobs are growing, and labor-based industries are coming from skill-based industries and will have to be replaced by knowledge-based industries. In this extremely aggressive situation where everyone interacts with each other, technology and innovation are transforming the world into a global village worldwide. Artificial intelligence helps companies perform any function more effectively and efficiently. The purpose of this research is to conduct a bibliometric analysis of the scientific literature that addresses the application and impact of artificial intelligence in the field of human resource management in a connected way. At the same time the topic is quite new and this paper will contribute to scientific researches in the form of theoretical background. In the article literature review related to the topic will be used.

INTRODUCTION

Artificial intelligence represents a real breakthrough in business management and will have a profound impact on the way employees work, especially in human resources and employment departments. Artificial intelligence (AI) technologies are affecting the management of human resources in a different way. Artificial intelligence (AI) can have a major impact on the way modern societies respond to many of the challenges they face. When used correctly, AI can create a more equitable, healthy and inclusive society. Today, AI has become a mature technology and is an increasingly important part of the fabric of modern life.

A significant source of innovation today, artificial intelligence (AI), which is demonstrated by machines that display traits of human intelligence (HI), is being used in services more and more (Rust and Huang 2014). For instance, many aspects of our lives have been automated by robots for homes, healthcare, hotels, and restaurants; virtual bots have transformed customer service into self-service (Fluss 2017); portfolio managers have been replaced by big data AI applications

* Corresponding author. rmammadov@beu.edu.az (Zamin Babashov).

(Javelosa 2017); and social robots, like Pepper, have taken the place of human greeters in customer-facing services to greet clients (Choudhury 2016). Because of these advancements, some have said that we are living in the fourth industrial revolution, where technology is erasing the distinction between the digital, biological, and physical domains (Schwab 2017).

The threat and revolution of AI have drawn the interest of researchers from a variety of fields. Regarding the development of AI, there are two main lines of inquiry. While the economic literature tends to concentrate on the impact of AI on jobs, the service and technological literatures prefer to highlight the benefits of using AI technology. Applications of intelligent technology (Colby, Mithas, and Parasuraman 2016; Marinova et al. 2017; Rafaeli et al. 2017), services made possible by different technologies (Huang and Rust 2013), and service technologies (Kunz et al. 2018) are frequently the subject of the service literature. According to research, technological advancements should have expected effects, such as a rise in the use of self-service technologies (Meuter et al. 2000), increased optimal productivity (Rust and Huang 2012), and a greater service.

The practical contribution of this research is to emphasize the importance of transforming the human resources management function into a digital environment that provides higher activation for the human resources department and will be reflected in higher performance and employee retention.

Artificial Intelligence

What is assumed to be "artificial" about artificial intelligence is undoubtedly related to its origins and the way it was created, in that it emerged not as a result of natural (especially biological or evolutionary) influence, but as a product of human creation and creativity. In other words, artificially intelligent things differ from naturally intelligent ones in that they are artificial objects that have special properties that non-artificial ones normally have. In other words, they are things that have a certain property (intelligence) as a result of a certain process (because they were created, designed or manufactured in this way). Artificial intelligence is defined as machine intelligence or intelligence demonstrated by machines, as opposed to natural intelligence demonstrated by humans. The term artificial intelligence is often used to describe machines that mimic human cognitive functions such as learning, understanding, reasoning or problem solving (Russell and Norvig 2016). Artificial intelligence (AI) is the use of technology to do something that would normally require a certain amount of knowledge. This also refers to the skill level of technologically trained systems on par with human performance. (Palos-Sánchez et al, 2022)

Despite the uncertain origins of the concept of artificial intelligence, two authors stand out in its development. On one side, there is A. M.Turing, the father of modern computation, and on the other side, there is J. McCarthy, the father of artificial intelligence. Turing (1937) introduced the concept of algorithms and laid the foundations of computer science. Later, Turing (1950) proposed the Turing test, which tests whether a machine is capable of being as intelligent as the person performing its functions. Here, if a machine can have a conversation that is indistinguishable from a conversation with a human, then it is reasonable to say that the machine is intelligent. If the evaluator cannot documentably state that the machine is different from a human, the machine is said to have passed the test (Moor, 2003). The Turing test was the first experiment proposed to measure machine intelligence. People were excited because for the first time, computers were solving problems like humans and appeared to be intelligent. The broader AI research community shared the initial optimism by making bold claims and increasing

popularity. There are examples of AI solving problems involving algebraic application problems, language translation, geometric theorem proof, etc. However, J. McCarthy coined the term "artificial intelligence" during a conference at Dartmouth (Paesano, 2021). In the 1950s and 1960s, it was expected that AI would rapidly evolve into computers and robots with human-level cognitive abilities, but this did not happen until recently when it came to the fore (Bolander 2019; Pillai and Sivathanu 2020). Of course, the concept of Artificial Intelligence (AI) was on the minds long before the advent of computers. Artificial intelligence basically refers to the processing of human intelligence by machines, especially computer systems. However, defining intelligence many times is a nuanced task. Intelligence encompasses various aspects such as problem-solving ability, learning ability, adaptability, creativity, and understanding complex concepts. Artificial intelligence aims to replicate these cognitive abilities across machines. Initially, the focus was on symbolic AI, which required computers to follow explicit rules to solve problems. However, as our understanding of intelligence has changed, AI techniques have changed accordingly. Modern AI, particularly machine learning and deep learning, allows machines to learn from data, recognize patterns, and make decisions based on experience. Despite its prevalence, AI still lags behind human intelligence in many ways. Human intelligence is not limited to solving problems; it also includes areas such as understanding the context in which AI encounters it, emotions, social characteristics, and ethical controls. So, while the term "intelligence" is difficult to define, AI aims to mimic and extend human cognitive abilities to perform tasks that typically require human intelligence in machines.

Since the advent of computers, the possibility of creating intelligent computers has intrigued many people. When we look back in history, the first signs of AI date back much further. So if intelligence itself is so difficult to define, what do we mean by AI?

Artificial intelligence is different from regular software systems because it can perform complex calculations quickly, use complex methods, and process large amounts of high-quality aggregated data (Jia et al., 2018). "Humanized" artificial intelligence (AI) has many skills, such as cognitive, emotional, and social intelligence (Radonjic et al., 2022). In the digital business era, AI has become a more transformative force in redefining management and the strategic practices of the firm (Kshetri, 2021; Vrontis et al., 2021). Artificial intelligence (AI) systems have been used for a long time and in many different areas. However, it is only in the last few years that this technology has taken major steps forward and become widely used across many different types of organizations (Hussain et al., 2019).

The capacity to digest and learn from knowledge in order to solve problems is known as analytical intelligence (Sternberg 1984, 2005). This relates to mathematical abilities, logical reasoning, and information processing (Sternberg 1999). For instance, people that work with computers and technology, data scientists, mathematicians, accountants, financial analysts, auto repair specialists, and engineers all strongly rely on analytical skills, which are acquired through training, knowledge, and specialty in cognitive thinking.

The two main analytical AI applications are data analytics and machine learning. Typical analytical AI uses algorithms to learn iteratively from data to locate insightful information without being instructed where to look for a specific piece of information. Machine learning comes in a variety of forms (SAS Institute, Inc. 2017). Deep Blue, a chess computer manufactured by International Business Machines Corp. (IBM), employs

In recent years, computer science has encompassed many related areas such as Machine Learning (ML); advances in teaching machines how to learn from experience, examining large data sets, and finding hidden patterns are reviving Artificial Intelligence (Kubat, 2017). Furthermore, AI is a technology that attempts to simulate human reasoning in computers and other types of machines (Rodgers and Al Fayi, 2019). While AI can improve many areas of life, there are also risks that need to be considered. The potential for AI to be used in ways that harm humans poses a great risk. For example, the use of AI-powered weapons systems could lead to increased civilian casualties due to war. There is also the risk that AI-powered surveillance systems could violate privacy and civil rights. Another risk associated with AI is that the technology could be used to oppress certain groups. AI algorithms can be as objective as the data they are trained on, and if that data is biased, so will the resulting algorithm. This could lead to unfair and discriminatory outcomes, such as people being excluded from housing, credit, or employment opportunities because of their ethnicity, gender, or other personal characteristics. Another major concern is that AI could cause people to lose their jobs, as computers and algorithms take over tasks previously performed by humans. This could lead to a serious social and economic crisis, especially for those in low-skilled jobs. Additionally, AI has the potential to spread misinformation and generate deepfakes, both of which can influence public opinion and therefore affect political outcomes. These risks can be mitigated with appropriate planning, rules, and monitoring. It is important for government, academia, and business leaders to collaborate to ensure that AI is developed and used responsibly and fairly. Conducting research that identifies and addresses the dangers and negative consequences of AI technology is vital to maximize its benefits while minimizing harm. (Venice, J. A et al., 2021: 241-249).

The Application of AI in HRM

As technology changes rapidly and steadily around the world, it is clear that businesses and other industries are eager to use the creativity of AI systems, mostly because they are very effective and improve workflow in many ways. A significant change has occurred in the business world due to the widespread use of artificial intelligence (AI) technology in many specialized fields such as human resource management (HRM) (Malik et al, 2020). The integration of AI in HRM can be depicted in four categories: (1) It is a system that thinks like a human, (2) It thinks rationally, (3) It acts like a human, and (4) It acts rationally (George and Thomas, 2019). In addition, AI technology can benefit HRM in the following areas of operation: (Rodgers, 2020).

- Time-pressed decisions: The cost of making decisions without rushing is high (speed is very important).
- Accuracy: The cost of wrong decision choices is minimized.
- Allocation of resources: The data size is too large for manual analysis or traditional algorithms.
- Decisions where predictive accuracy is more important than explanation or disclosure.
- Providing information where regulatory requirements are light

Human capital is a differentiating factor for an organization as it is an intangible resource that is difficult for competitors to imitate and therefore provides a potential competitive advantage to any organization (Kearney and Meynhardt, 2016). The role of AI in an organization is to increase the efficiency and effectiveness of the HR function by making various management processes

agile and accurate (Nankervis et al., 2021). AI for HRM will enable the understanding and control of a data collection process, thus integrating this process into the organizational and economic efficiency strategy (Varma et al., 2022).

Most contemporary HR professionals are using AI for a wide range of tasks and purposes, including but not limited to employee records management, payroll processing, recruiting and hiring, evaluation and feedback. Artificial intelligence (AI) can automate various human resources (HR) operations, including hiring, firing, and distributing information about benefits packages and compensation levels. The different areas that make up HRM in an organization where AI is in its infancy include:

(1) talent search and recruitment,
(2) training and development,
(3) performance analysis,
(4) career development,
(5) compensation,
(6) personnel turnover (Abdeldayem and Aldulaimi 2020; Navaz, 2020; Qamar et al., 2021; Yahia et al., 2021).

However, implementing AI in HR can have its drawbacks, such as inherent limitations of the technologies and hackability. AI has revolutionized the field of HR through the application of machine learning and algorithms to increase efficiency, reduce bias, and improve decision-making. However, some companies have been slow to fully embrace AI due to its current limitations and concerns about security issues.

This research will discuss the current status of AI in HR as well as its potential future developments. AI uses consistent computer technologies and pre-programmed algorithms to produce instantaneous decisions. AI will have ripple effects in the HR sector. When a company's HR department combines its human touch with its technological savvy, it benefits both job candidates and employees. The use of AI in HR will also help communicate the importance of speed and efficiency. The Role of AI in HR: The HR department is responsible for time-consuming processes such as hiring and training new employees. Many tasks in HR can be simplified with the help of AI. Finding and Retaining the Best Employees: The HR department plays a vital role in expanding the business by finding and hiring qualified candidates. The use of AI in HR can be most noticeable in talent acquisition. Tasks such as candidate screening, database maintenance, interview scheduling, and question answering are all made easier with the help of AI. The reduction in recruitment efforts allows HR to focus on value-added activities such as talent acquisition, personnel management, and awareness campaigns. Human resources will be able to use AI to find the candidate who is almost ideal for the organization. Therefore, the screening process is simple, fast, and useful. The most promising potential customers are identified and followed up with the help of chatbots. These intelligent chatbots manage the recruitment process and assign new employees to jobs that best suit their skills.

Human resources (HR) departments can use AI in their software to evaluate data and identify employees who may need more training.

Artificial intelligence (AI), more commonly known, is one of the most important technological developments that has changed the way people work. It is important to realize the possible effects of AI development according to academic standards (Tambe et al., 2019).

Digital technologies have completely changed the way we do our job, leading to a major change and great progress in business management (Da Silva et al., 2022). In fact, with the accelerating development and widespread application of Artificial Intelligence (AI) and other groundbreaking technologies, the interaction between firms, employees and customers is mainly intensified by the change and automation of administrative components of HRM activities and tasks (Lariviere et al., 2017; Marler and Parry, 2016). With the development of Artificial Intelligence (AI) technology, the new generation of labor, like human intelligence in artificial intelligence, has become the key factor for enterprises to survive and transform in the changing environment (Ertel, 2018).

CONCLUSION

AI has impacted and changed many aspects of our daily lives. There are opportunities to address ethical, legal, and strategic challenges in HRM practice and research. AI software has impacted the HRM process by reducing inefficiencies and the time required to complete tasks, but trust issues with employees and management still persist. If organizations' HRM teams fail to keep up with future developments in AI technology, their organizations may not be able to compete effectively in attracting and hiring employees for influential roles.

The main drivers for the adoption of AI-HRM are the increasing need for skilled personnel, the changing nature of work, and technological advances. The development of AI-HRM should also embrace the principles of human dignity, autonomy, and diversity, and include active stakeholder participation.

A change in conventional methods is highlighted by the revolutionary potential of artificial intelligence (AI) in the field of human resources management (HRM), which combines cutting-edge technology with strategic human capital management. This study demonstrates how AI both facilitates and disrupts HR operations, changing everything from hiring to performance reviews and employee involvement. A future where human resource practices are in line with corporate objectives has been paved by the potential for improving operational efficiency, streamlining decision-making, and encouraging data-driven initiatives through the integration of AI-driven tools in HRM.

The recognition of AI's ability to perform intricate jobs quickly and accurately, such managing enormous databases, automating hiring procedures, and forecasting staff attrition, is one of the exploration's most important results.

REFERENCE LIST

1. Abdeldayem, M. M., & Aldulaimi, S. H. (2020). Trends and opportunities of artificial intelligence in human resource management: Aspirations for public sector in Bahrain. International Journal of Scientific and Technology Research, 9(1), 3867-3871.
2. Barro, S., & Davenport, T. H. (2019). People and machines: Partners in innovation. MIT Sloan Management Review, 60(4), 22-28.
3. Bolander, T. (2019). What do we loose when machines take the decisions?. Journal of Management and Governance, 23, 849-867.
4. Choudhury, S. R. (2016). SoftBank's Pepper robot gets a job waiting tables at Pizza Hut. CNBC.
5. Colby, C. L., Mithas, S., & Parasuraman, A. (2016, June). Service robots: How ready are consumers to adopt and what drives acceptance. In The 2016 Frontiers in Service Conference (pp. 23-26). Norway: Bergen.
6. da Silva, L. B. P., Soltovski, R., Pontes, J., Treinta, F. T., Leitão, P., Mosconi, E., ... & Yoshino, R. T. (2022). Human

resources management 4.0: Literature review and trends. Computers & Industrial Engineering, 168, 108111.

7. Ertel, W. (2018). Introduction to artificial intelligence. Springer.
8. Fluss, D. (2017). The AI revolution in customer service. Customer Relationship Management, 38.
9. George, G., & Thomas, M. R. (2019). Integration of artificial intelligence in human resource. Int. J. Innov. Technol. Explor. Eng, 9(2), 5069-5073.
10. Huang, M. H., & Rust, R. T. (2013). IT-related service: A multidisciplinary perspective. Journal of Service Research, 16(3), 251-258.
11. Hussain, A., Mkpojiogu, E. O., Abubakar, H., & Hassan, H. M. (2019). A mobile usability test assessment of an online shopping application. Journal of Computational and Theoretical Nanoscience, 16 (5-6), 2511-2516.
12. Javelosa, J. (2017). Major firm announces it's replacing its employees with AI. Futurism, March, 30.
13. Jia, Q., Guo, Y., Li, R., Li, Y., & Chen, Y. (2018). A conceptual artificial intelligence application framework in human resource management.
14. Kearney, C., & Meynhardt, T. (2016). Directing corporate entrepreneurship strategy in the public sector to public value: Antecedents, components, and outcomes. International Public Management Journal, 19(4), 543-572.
15. Kshetri, N. (2021). Evolving uses of artificial intelligence in human resource management in emerging economies in the global South: some preliminary evidence. Management Research Review, 44(7), 970-990.
16. Kubat, M. (2017). An introduction to machine learning. Springer.
17. Kunz, W., Heinonen, K., Lemmink, J., & Lucas, B. (2018). Future service technologies: business models, analytics, and experience. Journal of Services Marketing, 33(4), 502-506.
18. Larivière, B., Bowen, D., Andreassen, T. W., Kunz, W., Sirianni, N. J., Voss, C., ... & De Keyser, A. (2017). "Service Encounter 2.0": An investigation into the roles of technology, employees and customers. Journal of business research, 79, 238-246.
19. Malik, A., Budhwar, P., & Srikanth, N. R. (2020). Gig economy, 4 IR and artificial intelligence: Rethinking strategic HRM. In Human & technological resource management (HTRM): New insights into revolution 4.0 (pp. 75-88). Emerald Publishing Limited.
20. Marinova, D., de Ruyter, K., Huang, M. H., Meuter, M. L., & Challagalla, G. (2017). Getting smart: Learning from technology-empowered frontline interactions. Journal of Service Research, 20(1), 29-42.
21. Marler, J. H., & Parry, E. (2016). Human resource management, strategic involvement and e-HRM technology. The International Journal of Human Resource Management, 27(19), 2233-2253.
22. Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: understanding customer satisfaction with technology-based service encounters. Journal of marketing, 64(3), 50-64.
23. Moor, J. (Ed.). (2003). The Turing test: the elusive standard of artificial intelligence (Vol. 30). Springer Science & Business Media.
24. Nankervis, A., Connell, J., Cameron, R., Montague, A., & Prikshat, V. (2021). 'Are we there yet?'Australian HR professionals and the Fourth Industrial Revolution. Asia Pacific Journal of Human Resources, 59(1), 3-19.
25. Nawaz, N. (2020). Artificial intelligence applications for face recognition in recruitment process. Journal of Management Information and Decision Sciences, 23, 499-509.
26. Paesano, A. (2023). Artificial intelligence and creative activities inside organizational behavior. International Journal of Organizational Analysis, 31(5), 1694-1723.
27. Palos-Sánchez, P. R., Baena-Luna, P., Badicu, A., & Infante-Moro, J. C. (2022). Artificial intelligence and human resources management: A bibliometric analysis. Applied Artificial Intelligence, 36(1), 2145631.
28. Pillai, R., & Sivathanu, B. (2020). Adoption of artificial intelligence (AI) for talent acquisition in IT/ITeS organizations. Benchmarking: An International Journal, 27(9), 2599-2629
29. Qamar, Y., Agrawal, R. K., Samad, T. A., & Jabbour, C. J. C. (2021). When technology meets people: the interplay of artificial intelligence and human resource management. Journal of Enterprise Information Management, 34(5), 1339-1370.
30. Radonjić, A., Duarte, H., & Pereira, N. (2022). Artificial intelligence and HRM: HR managers' perspective on decisiveness and challenges. European Management Journal.
31. Rafaeli, A., Altman, D., Gremler, D. D., Huang, M. H., Grewal, D., Iyer, B., ... & de Ruyter, K. (2017). The future of frontline research: Invited commentaries. Journal of Service Research, 20(1), 91-99.

32. Rodgers, W. (2020). Artificial intelligence in a throughput model: Some major algorithms. CRC Press.
33. Rodgers, W., & Al Fayi, S. (2019, April). Ethical pathways of internal audit reporting lines. In Accounting Forum (Vol. 43, No. 2, pp. 220-245). Routledge.
34. Russell, S. J., & Norvig, P. (2016). *Artificial intelligence: a modern approach*. Pearson.
35. Rust, R. T., & Huang, M. H. (2012). Optimizing service productivity. Journal of marketing, 76(2), 47-66.
36. Rust, R. T., & Huang, M. H. (2014). The service revolution and the transformation of marketing science. Marketing Science, 33(2), 206-221.
37. Schwab, K. (2017). The fourth industrial revolution. Crown Currency.
38. Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and a path forward. California Management Review, 61(4), 15-42
39. Varma, A., Dawkins, C., & Chaudhuri, K. (2023). Artificial intelligence and people management: A critical assessment through the ethical lens. Human Resource Management Review, 33(1), 100923.
40. Venice, J. A., Thoti, K. K., Henrietta, H. M., Elangovan, M., Anusha, D. J., & Zhakupova, A. (2022, September). Intelligent Space Robots Integrated with Enhanced Information Technology and Development Activities. In 2022 4th International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 241-249). IEEE.
41. Yahia, N. B., Hlel, J., & Colomo-Palacios, R. (2021). From big data to deep data to support people analytics for employee attrition prediction. Ieee Access, 9, 60447-60458.
42. Sternberg, R. J. (1984). Toward a triarchic theory of human intelligence. Behavioral and Brain Sciences, 7(2), 269-287.
43. Sternberg, R. J. (2005). The theory of successful intelligence. Revista Interamericana de Psicología/Interamerican Journal of Psychology, 39(2), 189-202.
44. Sternberg, R. J. (1999). The theory of successful intelligence. Review of General psychology, 3(4), 292-316.
45. SAS. (2017). Machine Learning: What It Is and Why It Matters.