

# Artificial Intelligence in Human Resource Management: A PRISMA-based Systematic Review

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## Abstract

**Background:** Artificial intelligence (AI) is rapidly transforming human resource management (HRM) by automating essential functions such as recruitment, employee performance evaluation and workforce planning. Despite the growing adoption of AI-driven tools, organizations face numerous challenges, including resistance from HR professionals, ethical concerns and data privacy issues. This transformation has sparked significant academic interest, yet several gaps remain in understanding how AI affects HRM practices and organizational outcomes.

**Objective:** This study aims to explore the integration of AI in HRM by analysing its potential opportunities and challenges. Additionally, it investigates how human-AI collaboration can enhance HR functions and drive organizational performance.

**Methods:** A systematic literature review approach was adopted, focusing on 141 recent peer-reviewed articles from Scopus-indexed journals. This review focused on studies published between 2019 and 2025. The analysis was structured around three key dimensions: AI-driven opportunities, challenges associated with AI adoption and its transformative impact on HRM practices.

**Results:** The findings reveal that AI offers significant benefits in HRM, such as improving efficiency, reducing bias and enhancing employee engagement. However, challenges remain regarding ethical decision-making, data security and maintaining human interaction in HR processes. The study also highlights the importance of augmenting, rather than replacing, human roles with AI tools to achieve optimal outcomes.

**Conclusion:** AI has the potential to reshape HRM by streamlining processes and enhancing decision-making. Nevertheless, its successful implementation requires addressing critical challenges such as resistance to change, ethical concerns and legal risks. Organizations should focus on fostering human-AI collaboration to unlock the full potential of AI-driven HRM.

## Index Terms

Human resource management; Artificial intelligence; Ethical AI in HR; AI-employee collaboration; Talent management; Systematic literature review.

## 1 INTRODUCTION

The emergence of a new industrial revolution is reshaping industries worldwide, driven by the integration of advanced digital technologies such as artificial intelligence (AI), the internet of things (IoT), speech recognition and virtual reality. These innovations are transforming the way businesses operate, automating processes, optimizing decision-making and redefining employee roles (Ngayua et al., 2021). Within human resource management (HRM), AI is increasingly recognized for its potential to enhance workforce efficiency, streamline administrative tasks and support strategic decision-making (Faqihi & Miah, 2023).

By automating repetitive HR functions, AI enables professionals to focus on high-value activities such as talent management, employee engagement and organizational planning (Mishra et al., 2021).

Academic interest in the role of AI in HRM has grown significantly in recent years, with research spanning HRM, information technology and management disciplines. Scholars have examined applications of AI in recruitment, performance management, employee retention and workforce planning, recognizing both its benefits and limitations (Walker & Larson, 2025; Kim et al., 2025; Gibson & Stubbs, 2024; Sithambaram & Tajudeen, 2023). While some studies highlight the potential of AI to enhance organizational performance metrics, others focus on employee-related concerns, such as job security and evolving workplace dynamics (Radonjić et al., 2024; Bukartaite & Hooper, 2023).

However, AI-driven solutions offer tangible benefits for HRM. Automating tasks such as recruitment, onboarding and employee training enables HR professionals to allocate more time to strategic workforce planning (Parviainen, 2022; Kaushal et al., 2021). AI-powered analytics also enhance decision-making by predicting turnover risks, absenteeism trends and workforce needs, allowing HR teams to implement proactive strategies (Aycan & Bal, 2024). Additionally, AI can reduce human bias in hiring and promote diversity and inclusion (Alnsour et al., 2024). Emerging technologies, such as AI-driven chatbots and virtual assistants, further improve employee engagement by providing real-time feedback and personalized learning experiences (Maity, 2019; Yi et al., 2023).

Despite its potential advantages, integrating AI into HRM practices is not without obstacles. Organizations often encounter resistance from HR professionals, data scarcity and legal uncertainties when deploying AI-powered tools (Tilmes, 2022; Sipior et al., 2024). Additionally, concerns over data privacy, algorithmic bias and ethical considerations complicate adoption of AI in workforce (Mikhlin & Saukkonen, 2024; Figueroa-Armijos et al., 2023). While AI enhances efficiency, it can also reinforce existing inequalities in recruitment and performance evaluations due to biases inherited from training data (Soleimani et al., 2022). These challenges highlight the importance of ethical AI governance and transparency in HR decision-making (Chen Z., 2023).

Several literature reviews have explored the role of AI in HRM, examining its impact on various HR functions and assessing emerging trends (Priksat et al., 2022; Votto et al., 2021; Tuffaha & Perello-Marin, 2023; Tusquellas et al., 2024; Kaushal et al., 2021; Zhai et al., 2024). However, existing reviews have followed varied methodological approaches, often incorporating sources with different levels of scientific rigour, such as conference papers, industry reports and book chapters. Additionally, while some studies focus exclusively on a single HR practice (e.g., recruitment or performance evaluation), others provide broad thematic discussions without clearly distinguishing the impact of AI across different HR functions. This fragmented approach makes it difficult to assess the full scope of the role of AI in HRM and its varying applications across HR practices.

To address these limitations, the present study conducts a PRISMA-based systematic literature review, focusing solely on peer-reviewed articles published in Scopus between January 2019 and February 2025. By adopting this structured methodology, the review ensures transparency and reproducibility, providing a comprehensive synthesis of impact of AI on HRM. Unlike previous studies, this review categorizes AI applications by distinct HR functions, offering a clearer perspective on AI-driven transformations in workforce management and the implications of human-AI collaboration. It also examines broader ethical, organizational and strategic challenges, providing insights relevant to both scholars and HR professionals. To guide the analysis, this article is structured around four key themes:

- main application areas of AI within HR practices;
- potential challenges, risks and limitations of AI implementation;
- human-AI collaboration and the role of trust; and
- future research directions and practical implications.

## 2 METHODS

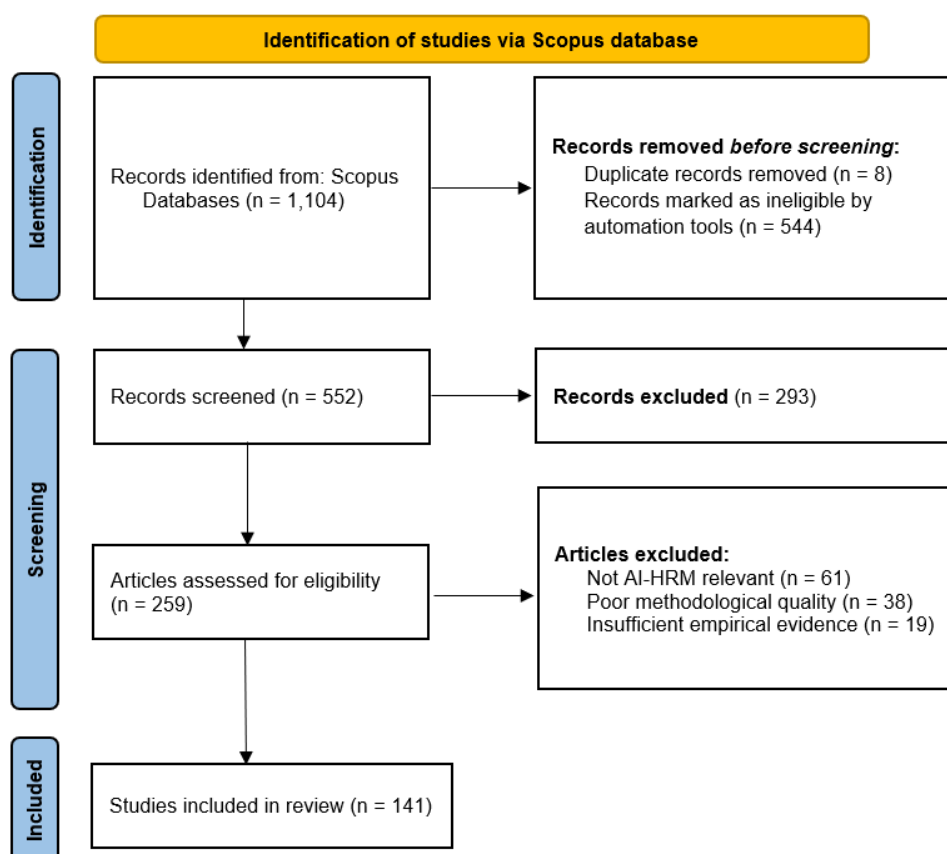
The present study follows a systematic literature review approach, employing the PRISMA guidelines to ensure a structured and transparent selection process. The methodology was designed to enhance reproducibility and minimize bias through a clear sequence of steps, including article identification, screening, quality assessment and final inclusion (Moher et al., 2009).

## 2.1 Eligibility criteria

This review focused on peer-reviewed journal articles that explore the intersection of artificial intelligence and human resource management. The eligibility criteria included studies published between 2019 and 2025 (the last search was on 23 February 2025), written in English and indexed in Scopus under the subject areas of business, management and social sciences. Articles were required to discuss AI applications in HRM, such as recruitment, selection, HR planning, or employee performance evaluation. Studies that focused on AI in unrelated domains (e.g., finance, healthcare) were excluded.

## 2.2 Data sources and search strategy

A structured query was formulated, combining AI-related terms ("artificial intelligence", "machine learning", "deep learning", "AI", "ML" and "DL") with HRM-related terms ("human resource management", "HRM", "talent management", "workforce management", "recruitment", "hiring", "selection process", "employee performance", "performance evaluation", "HR analytics", "compensation management", "payroll automation", "employee retention", "turnover prediction", "job satisfaction", "HR planning", "training and development", "learning and development", "career development", "ethical AI in HR", "HR strategy", "leadership development"). The search also applied exact keyword matching, including "feature selection", "job satisfaction", "employment", "recruitment", "prediction", "AI", "artificial intelligence", "machine learning", "human resource management", "deep learning", "machine-learning", "human resources management", "artificial intelligence (AI)", "employee engagement" and "human resource". Following this search strategy, an initial dataset of 1,104 articles was retrieved.



**Figure 1.** PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram of systematic review.

## 2.3 Selection process

A multi-step selection process was implemented using Python-based automation to enhance efficiency and reproducibility. First, eight duplicate records were removed. Next, a series of automated filtering steps were applied using Pandas, NumPy and Scikit-learn libraries. Articles that did not contain both AI-related and HRM-related keywords in the title, abstract or keywords were removed, reducing the dataset by 544 articles. Further text

preprocessing techniques, including lowercasing, tokenization and stop word removal, were used to refine the dataset. Natural language processing (NLP) techniques were employed to rigorously match all extracted AI and HRM keywords, ensuring that only articles covering both domains were retained.

Following this automated step, a manual review was conducted to verify the relevance of each article, ensuring alignment with the research objectives and removing any studies that did not meet the criteria despite passing the automated filtering. After this process, 259 articles were selected for further evaluation (see Figure 1).

## 2.4 Data collection process

For the 259 selected articles, key bibliographic and abstract data were extracted, including authors, year of publication, research methodology, study focus and main findings. The final dataset was categorized into three primary themes:

- (i) AI applications across various HRM practices, including recruitment and talent acquisition, performance management, HR planning, turnover management, compensation and benefits, training and development;
- (ii) Human-AI collaboration; and
- (iii) Ethical and algorithmic bias in AI-driven HRM.

## 2.5 Risk of bias assessment

To ensure methodological rigour, the Critical Appraisal Skills Programme (CASP) checklist was applied to assess the quality of the selected studies. This assessment considered the clarity of research methodology, the presence of empirical data, references and the validity of conclusions. Based on these criteria, 61 studies were excluded for insufficient focus on AI in HRM, 38 for weak methodological foundations and 19 for lacking empirical evidence. After this assessment, 141 studies met the criteria for final inclusion.

## 2.6 Data synthesis

The final dataset of 141 studies was analysed through a thematic synthesis approach, allowing for the identification of key trends and insights into AI applications in HRM, see also Online appendix. The studies were categorized based on their focus areas to provide a structured synthesis of the literature. A PRISMA flow diagram (Figure 1) was developed to visually represent the selection process, detailing each step from initial identification to final inclusion. This structured approach ensures transparency and allows future researchers to replicate the methodology.

# 3 RESULTS AND DISCUSSION

## 3.1 AI in HRM practices

### 3.1.1 AI-powered recruiting

Artificial intelligence is fundamentally reshaping recruitment and selection, enhancing efficiency, objectivity and candidate experience. Organizations increasingly make use of AI-driven tools such as chatbots, natural language processing and machine learning (ML) algorithms to streamline hiring processes, reduce human bias and optimize decision-making (Hu, 2023; Felderer et al., 2023). Chatbots facilitate initial candidate interactions, making recruitment faster and more engaging, while ML analyses resumes, evaluates candidate potential and refines applicant ranking based on predictive analytics (Gong et al., 2025; Tian et al., 2023). For example, the RoboRecruiter chatbot automates end-to-end recruiting, attendance tracking, performance management and onboarding activities, allowing HR teams to focus on strategic decision-making (Nawaz & Gomes, 2019). This integration creates a more dynamic and responsive recruiting process, allowing companies to interact with candidates in a personalized way (Allal-Cherif et al., 2021). AI-powered chatbots also enhance the candidate experience by providing real-time assistance, conducting initial screenings and offering job recommendations based on skill compatibility (Tay et al., 2024). Large organizations such as Unilever, Vodafone, PwC and Oracle have reported a 90% reduction in hiring time and a 16% increase in workforce diversity by integrating AI into their recruitment strategies (Mariani & Dwivedi, 2024).

Indeed, AI significantly improves decision-making and candidate evaluation. AI-driven recruitment systems assess applicants beyond simple keyword matching, incorporating linguistic analysis, behavioural assessment in video interviews and sentiment analysis to predict performance and organizational fit (Johnson et al., 2022; Bazrkar et al., 2024). These advancements are particularly useful in industries such as hospitality and retail, where AI supports mass hiring efforts by automating job postings, rediscovering past applicants and optimizing workforce allocation (Rab-Kettler & Lehnervp, 2019).

As AI adoption in recruitment continues to evolve, organizations must carefully balance efficiency with ethical responsibility (Pandey et al., 2025). AI-assisted hiring increasingly involves meta-algorithmic judgment, where AI provides data-driven recommendations, but recruiters adapt their decision-making based on algorithmic outputs. This shift reflects a growing reliance on AI to filter and assess candidates while ensuring that final decisions remain under human control (Roumbanis, 2025). AI has the potential to promote more inclusive hiring practices, provided that companies actively refine their AI recruitment strategies, implement regular audits and establish guidelines for responsible AI usage (Kelan, 2024).

### 3.1.2 AI in HR planning

Using AI tools in HR planning offers a strategic advantage by enhancing decision-making processes, optimizing scheduling and aligning workforce supply with demand. These tools analyse parameters such as real-time demand, historical data, deadlines and workforce availability to develop on-demand and just-in-time schedules, ensuring efficient resource utilization and operational flexibility (Vrontis et al., 2023). This allows HR professionals to proactively adjust staffing decisions based on dynamic business needs, moving beyond traditional reactive workforce management approaches (DiClaudio, 2019). AI-driven models, such as the Fordful Carson method (FCM) for resource allocation, have already proven effective in improving scheduling accuracy and efficiency. This underscores the growing role of AI in streamlining HR operations and making workforce management more responsive and strategic (Zhang & Pan, 2022).

A major aspect of strategic HR planning involves understanding an organization's core competencies and potential skill gaps, which directly influence talent management strategies (Malik, 2022). AI-driven systems analyse large datasets to map employee skills, track career progression and identify future workforce requirements, allowing HR leaders to refine their hiring, training and retention strategies (Venugopal et al., 2024). Machine learning models detect emerging trends in required skills, ensuring that employees receive personalized training programmes to remain competitive on evolving job markets (Rabenu & Baruch, 2025).

Moreover, AI also enhances succession planning and leadership development. By evaluating employee performance, career trajectories and retention risks, AI can help identify high-potential candidates for leadership roles, ensuring continuity in key positions (Chakraborty & Biswas, 2019). Additionally, predictive analytics assist in task allocation optimization, reducing inefficiencies and improving HR decision-making regarding workforce distribution (Pereira et al., 2023).

The contribution of AI to HR planning extends to risk mitigation, particularly in addressing employee attrition and turnover. Advanced ML models have demonstrated high accuracy in predicting workforce attrition, enabling HR professionals to develop proactive retention strategies (Venugopal et al., 2024). By integrating AI insights with financial data, market trends and employee performance records, organizations can better align HR strategies with business objectives, ensuring a cohesive and data-informed workforce planning approach (Gélinas et al., 2022).

### 3.1.3 AI-enhanced compensation and benefits

AI automates payroll tasks, reducing administrative burdens and improving accuracy (Votto et al., 2021). It calculates salaries, ensures tax compliance, detects payroll errors and tracks administration of benefits (Ghosh et al., 2024). AI enables companies to personalize compensation and benefits, aligning rewards with employee needs to enhance motivation and productivity (Huang et al., 2023). In contrast to traditional systems, AI continuously adjusts compensation structures based on market trends and performance data (Marler, 2024). AI-driven compensation systems benchmark salaries in real time, integrating economic trends and industry shifts (Stone et al., 2024). They analyse extensive datasets, improving internal pay equity and competitive positioning. Yet, predictive models refine salary adjustments in companies such as Google, while UK financial institutions use AI to tailor regional



compensation structures (Cheng & Hackett, 2021). HelloWallet integrates government salary data to improve pay equity insights (Cheng & Hackett, 2021).

Indeed, the lack of transparency in AI decision-making complicates salary justification (Marler, 2024). It also enhances fairness by identifying pay disparities and reducing bias (Parent-Rochelleau & Parker, 2022). Additionally, ethical concerns arise regarding distributive, procedural and interactional justice, requiring AI governance frameworks to ensure fairness (Priksht et al., 2022). Nevertheless, it increases average employee compensation (AEC) but widens the executive-employee pay gap, particularly in tech-intensive firms. Skilled workers benefit from AI-driven salary increases, while lower-skilled employees see limited growth (Yuan et al., 2023).

Furthermore, compensation remains central to employee motivation. Among employees, 60% of Generation Z consider money the primary indicator of success, a perception shaped by economic experiences similar to those of Baby Boomers (Aggarwal et al., 2022). The role of AI in payroll management must align with ethical, transparent and employee-centred compensation strategies.

### 3.1.4 AI in employee turnover management

Managing employee turnover is a persistent challenge for organizations, influencing productivity, operational efficiency and workforce stability. Advances in artificial intelligence have transformed how companies predict and address attrition, allowing HR professionals to take proactive measures to retain talent (Yuan et al., 2024). Indeed, several factors are detected using data analysis through AI that contribute to an employee's decision to leave, ranging from job satisfaction and career growth opportunities to compensation and workplace relationships. Studies highlight that fairness in pay, strong leader-member relationships and clear career paths significantly reduce turnover intention (Yuan et al., 2024). Conversely, long working hours, lack of training and unclear promotion policies increase the likelihood of employees leaving (Santhanam et al., 2021). In industries such as IT, where job alternatives are abundant, dissatisfaction with compensation and limited career progression remain major drivers of high turnover rates (Khera & Divya, 2019). Additionally, when supervisors transition to new organizations, employees often follow, demonstrating the influence of workplace relationships on retention (Becker et al., 2023).

Predictive models such as random forest, gradient boosting and deep neural networks have proven highly effective in identifying patterns that indicate a higher risk of attrition (Srivastava & Eachempati, 2021). These models assess variables such as job performance, employee engagement, promotion history and workload distribution, enabling HR managers to intervene before dissatisfaction escalates into resignation (Srivastava & Eachempati, 2021). By making use of AI, organizations can make data-driven adjustments to compensation structures, training programmes and job responsibilities to improve employee retention (Khera & Divya, 2019). Indeed, AI supports retention efforts by personalizing career development and training programmes. ML applications, including chatbots and natural language processing tools, assist in tailoring employee learning experiences, ensuring that professional growth aligns with individual aspirations and company needs (Indarapu et al., 2023). Organizations adopting AI-driven workforce planning anticipate future skill demands, optimize training initiatives and create targeted incentives to reduce voluntary turnover (Tusquellas et al., 2024).

### 3.1.5 AI in workforce training and skill development

Unlike traditional training programmes, which often follow a rigid structure, AI-powered systems adjust learning content in real time, catering to employees' unique needs and progress (Niehueser & Boak, 2020). This shift is helping businesses move away from outdated one-size-fits-all training models towards personalized learning experiences that improve skill retention, training transfer and overall performance (Kellogg et al., 2020).

AI enhances training efficiency by analysing how employees engage with learning materials and identifying where they struggle or excel. Based on these data, AI-driven platforms provide tailored recommendations, ensuring that employees focus on the skills they need rather than wasting time on irrelevant content (Sposato, 2024). Many companies now use intelligent tutoring systems and machine learning algorithms to personalize training, making learning paths more efficient (Chen, 2023). AI-powered learning platforms introduce interactive elements such as gamification, virtual simulations and real-time feedback. These features help employees stay motivated while allowing them to practice real-world scenarios in a risk-free environment (Bhatt & Muduli, 2023). Platforms such as Moodle and Blackboard have integrated AI to support adaptive learning and enhance engagement through data-driven insights (Bhatt & Muduli, 2023).

Moreover, AI helps organizations streamline knowledge sharing by automating the management of training resources. Employees can access on-demand learning materials, ensuring that training is available whenever and wherever it is needed (Arslan et al., 2022). It also improves general employee training and plays a growing role in leadership development and strategic workforce planning. Organizations are using AI-powered analytics to assess leadership skills, track performance trends and offer personalized coaching recommendations (Langer & König, 2023). These insights help identify employees with leadership potential and create targeted development programmes to prepare them for management roles. At the same time, AI is helping HR teams predict future skill shortages and design upskilling programmes that align with evolving business needs (Verma et al., 2024). Instead of reacting to workforce gaps, companies can proactively train employees in emerging skills, ensuring that they remain competitive on a rapidly changing job market.

The role of AI in training is expected to expand even further with the introduction of virtual reality (VR) and augmented reality (AR). These immersive technologies will allow employees to learn by doing, offering hands-on simulations that replicate real-world scenarios (Tolentino et al., 2024). This approach is particularly useful in industries where practical experience is essential, such as healthcare, engineering and customer service. Additionally, AI-driven predictive analytics will enable companies to track employee learning progress and identify skill gaps before they become a problem (Prentice & Nguyen, 2020). Rather than waiting for performance issues to arise, organizations will be able to offer targeted training interventions, ensuring that employees stay up to date with industry demands. Then, in the coming years, companies that integrate AI into their training strategies will enhance workforce performance and build a culture of continuous learning. Employees will have access to smarter, more engaging and more relevant training opportunities, keeping them adaptable and ready for the future of work (Park, 2024).

### 3.1.6 AI and employee performance management

Artificial intelligence is expanding employee performance analytics by enabling real-time monitoring and data-driven evaluation (Hmoud, 2021). AI-powered systems collect and analyse vast amounts of data, reducing human bias and enhancing transparency in performance assessments (Abid et al., 2024). These systems use ML algorithms to evaluate employees' contributions, identify patterns of success and support decision-making in talent development (Basu et al., 2023). Several companies make use of AI to monitor employee behaviour and assess performance through real-time analytics. For example, IBM, Google and Tesla have implemented AI-driven systems to track productivity and provide data-driven insights that help managers identify areas for improvement. These AI-powered solutions analyse employee engagement levels and work patterns, enhancing performance evaluations while minimizing human bias (Mer, 2023). By integrating predictive analytics, organizations gain deeper insights into employee productivity and engagement, leading to more strategic HR decisions (Jia & Hou, 2024).

Indeed, AI-driven performance management enhances employee motivation by providing personalized feedback and development opportunities (Song & Wu, 2021). Adaptive AI models tailor training programmes based on individual performance metrics, fostering continuous learning and career growth (Gupta et al., 2024). Coaching-based AI tools further refine the feedback process by offering interactive guidance, helping managers deliver constructive performance appraisals (Varma et al., 2024). Furthermore, Industry 5.0 emphasizes human-AI collaboration to enhance efficiency and innovation in the workplace. In this context, AI is increasingly used to automate repetitive tasks, enabling employees to focus on high-value strategic activities. Deloitte, for example, employs AI-driven productivity analytics to optimize workflows, analyse employee interactions and provide feedback that facilitates continuous improvement (Joshi & Masih, 2023). These AI-driven interventions enhance efficiency and contribute to psychological empowerment, reinforcing employee autonomy and engagement as critical factors in job performance (Gao et al., 2023).

AI-enabled HRM systems also influence psychological empowerment by fostering a sense of autonomy and recognition. Employees who perceive AI as a fair and supportive tool in performance management are more likely to be engaged and motivated (Chin et al., 2024). However, achieving this balance requires AI systems that are transparent, unbiased and designed to complement human judgment rather than replace it (Kock et al., 2020). As AI continues to evolve, its integration into performance management must prioritize both efficiency and employee well-being to maximize its impact on organizational success (Wuisan et al., 2023).

## 3.2 AI challenges in HRM

### 3.2.1 Ethical dilemmas and legal issues of AI in HRM

AI integration in HRM offers significant benefits in terms of efficiency and decision-making but also raises ethical and legal concerns that organizations must address. Issues such as bias, transparency, privacy and accountability remain central to discussions on AI adoption in HRM (Nankervis et al., 2021). The complexity of HR phenomena and small datasets used in AI-driven decisions can introduce ethical constraints and distort decision-making processes, reducing fairness and integrity in hiring practices (Seppälä & Małecka, 2024).

One of the most pressing concerns is algorithmic bias, which can lead to discriminatory hiring decisions (Nacheva, 2024). For instance, some sourcing algorithms have been found to limit job visibility for underrepresented demographic groups, while AI-based assessments may disadvantage non-native speakers due to linguistic processing constraints (Varma et al., 2024). Indeed, Amazon's AI-driven recruitment system was found to penalize resumes containing terms associated with women due to biased training data, ultimately reinforcing gender discrimination (Carter, 2024). Also, Unilever's AI-driven recruitment system raised concerns about data privacy and fairness, as candidates expressed discomfort over being assessed by an opaque algorithm without clear human oversight (Bankins, 2021). Similarly, some AI vendors, such as Pymetrics and HireVue, promote their systems as fair but optimize selection rates based on legal frameworks rather than ensuring procedural fairness for all candidates (Seppälä & Małecka, 2024).

Privacy and data security also pose significant challenges. AI applications in HR often require access to vast amounts of employee and candidate data, raising concerns about how this information is stored, shared and used (Balcioğlu & Artar, 2024). In this context, the General Data Protection Regulation (GDPR) and other legal frameworks mandate transparency in AI decision-making to prevent data misuse and discrimination (Sandeep et al., 2025). However, compliance with multiple international regulations, such as the California Consumer Privacy Act (CCPA) and Personal Data Protection Act (PDPA), adds complexity for multinational corporations (Manroop et al., 2024). Additionally, emerging regulations, such as the EU AI Act and the Artificial Intelligence Liability Directive (AILD) proposal, highlight the growing emphasis on accountability and risk assessment in AI-driven decision-making (Rigotti & Fosch-Villaronga, 2024). The EU AI Act, for instance, classifies HR-related AI systems as "high-risk", requiring strict transparency measures and human oversight to mitigate potential discriminatory outcomes (Carter, 2024).

Another key issue is lack of transparency in AI decision-making, commonly referred to as the "black box" problem. Many AI models operate through opaque processes, making it difficult for HR professionals and candidates to understand the rationale behind hiring decisions (Clavel et al., 2025). This opacity reduces trust in AI-driven recruitment systems and can lead to accountability challenges when AI-generated recommendations contradict human judgment (Alexander et al., 2025). Regulatory bodies, such as the European Commission, have raised concerns about the ethical and legal viability of protection against AI-driven employment discrimination (Špadina, 2023).

To address these ethical and legal challenges, experts recommend ongoing audits and impact assessments to evaluate the fairness of AI applications and their compliance with legal standards (Francisco et al., 2022). Independent audits can help ensure accountability by identifying potential biases in AI-driven hiring processes and enhancing transparency (Zheng et al., 2024). Ethical governance frameworks, including fairness reporting systems and bias-mitigation techniques, have been proposed to align AI applications with organizational values and societal norms (Rao & Zhao, 2025). Additionally, corporate social responsibility (CSR) and environmental, social and governance (ESG) principles play a crucial role in promoting the ethical use of AI, ensuring that AI-driven HR practices align with broader human values and sustainable development goals (Chang & Ke, 2023).

### 3.2.2 AI implementation challenges in HRM

Implementing AI in HRM presents various practical and organizational challenges. One significant issue is the lack of trust and resistance from employees and HR professionals. Many employees fear that AI-driven systems will replace human decision-making, leading to job insecurity, stress and reduced autonomy in HR functions (Raisch & Krakowski, 2021). Concerns over automation replacing human roles in HR have been particularly noted in public



sector HRM, where AI adoption remains low due to a lack of technological infrastructure and investment (Chilunjika et al., 2022).

Another major challenge is the quality and reliability of AI-driven decision-making. AI-based HR evaluations often rely heavily on quantifiable data, overlooking critical human factors such as emotions, psychological considerations and workplace dynamics (Pan & Froese, 2023). As a result, employees may perceive AI-driven performance assessments as unfair, which can undermine their belief in procedural justice and weaken overall workplace morale (Chilunjika et al., 2022). Automated monitoring systems in AI-driven performance evaluations can also increase concerns over workplace surveillance, leading to heightened stress and resistance to AI adoption (Mendy et al., 2024; Khan et al., 2024). Furthermore, historical biases embedded in training datasets can reinforce existing discrimination patterns, necessitating continuous oversight and refinement to mitigate these risks (Li et al., 2023). Organizations must implement governance mechanisms to ensure that AI-driven performance management remains objective and aligned with employee development goals (Aydın & Turan, 2023).

The integration of AI with existing HR systems presents additional difficulties. Many HR professionals report challenges in aligning AI tools with traditional HR workflows, leading to inefficiencies in recruitment, employee evaluation and workforce planning (Cruz, 2024). Resistance to AI often stems from a lack of AI literacy and training, which prevents HR teams from effectively interpreting and utilizing AI-generated insights (Cruz, 2024). Moreover, ensuring cross-functional collaboration between HR, IT and legal departments is essential for the successful implementation and governance of AI-driven HR processes (Soleimani et al., 2022).

While AI offers significant advantages in personalized learning and skill development, not all employees are immediately comfortable with AI-driven learning tools. Concerns over data privacy, algorithmic bias and the lack of human interaction in training can deter employees from fully engaging with these systems (Tolentino et al., 2024). Some also worry that AI-powered training signals a shift towards automation replacing human roles (Arslan et al., 2022). To alleviate these fears, companies must clearly communicate that AI is designed to enhance rather than replace traditional training methods (Lukaszewski & Stone, 2024). Additionally, employees have varying levels of technological literacy, requiring user-friendly and adaptable AI-driven learning platforms that cater to diverse skill levels (Niehueser & Boak, 2020).

Indeed, AI-driven automation in HRM could lead to the elimination of certain roles, necessitating extensive reskilling and upskilling initiatives to prepare employees for the evolving workplace (Koman et al., 2024). While AI can enhance productivity and optimize HR decision-making, its implementation must be carefully managed to avoid negative social and economic consequences (Radonjić et al., 2024). To ensure a balanced approach, organizations must proactively address employee concerns by offering retraining programmes, promoting career mobility and positioning AI as a collaborative tool rather than a replacement for human expertise (Agrawal et al., 2024).

### 3.3 Business impact of AI in HRM

AI is transforming how organizations manage human resources, influencing decision-making, workforce strategies and operational processes. Companies integrate AI-driven tools to enhance efficiency in recruitment, talent management and employee development. Automation reduces administrative burdens, accelerates hiring and refines workforce planning, leading to cost savings and better resource allocation (Socoliuc et al., 2024; Wenting et al., 2024; Hao et al., 2024). ML models improve candidate selection and retention, helping organizations align talent acquisition with long-term goals (Pessach et al., 2020). AI-powered HR analytics facilitate personalized training programmes and career development, boosting employee engagement and productivity (Masud et al., 2024). These advancements contribute to organizational performance by strengthening succession planning and leadership pipelines (Hajal & Yeoman, 2024). Furthermore, AI supports decision-making by analysing employee data to identify trends and optimize workforce management (Botha, 2019; Maity, 2019). AI-powered systems enhance skill development, performance evaluation and employee retention strategies, ensuring that businesses maintain a competitive edge (Zhang H., 2024). Increased efficiency in HR operations translates into financial growth and improved organizational agility (Priksat et al., 2023).

Despite its advantages, AI adoption in HRM introduces challenges. Bias in AI-driven hiring tools can reinforce discrimination if models are trained on biased data (Kekez et al., 2025). Algorithmic decision-making may unintentionally limit workforce diversity or misalign HR strategies with broader business objectives (Bursell &

Roumbanis, 2024). Additionally, the evolving role of AI in HRM also presents uncertainties regarding job creation, changing workforce dynamics and the long-term impact on employment structures (Chowdhury et al., 2023). Nevertheless, balancing automation with human oversight is essential for effective AI integration in HRM (Shet & Nair, 2023). Organizations must implement AI-driven HR strategies with ethical considerations, ensuring alignment with corporate values and workforce needs (Boncella, 2024). A well-structured approach allows AI to enhance HR operations while preserving human insight, fostering a dynamic and inclusive work environment (Kulikowski, 2024).

### 3.4 Human-AI collaboration in HRM

The collaboration between artificial intelligence and human professionals in HRM is shaping a more efficient and adaptive workplace. AI is no longer just a tool for automation, but it has become a strategic partner that assists in complex problem-solving, decision-making and workforce management (Seeber et al., 2020). Organizations increasingly make use of AI to enhance productivity and consistency while ensuring that human expertise remains central to HR functions (Tuffaha et al., 2022).

AI and human professionals work together in recruitment by automating routine tasks such as resume screening and job matching. AI shortlists candidates based on predefined criteria, allowing HR managers to focus on in-depth evaluations such as cultural fit, motivation and interpersonal skills (Tinguely et al., 2023). This hybrid approach enables faster hiring decisions without compromising the human aspects of recruitment (Revillod, 2024). In performance management, AI supports HR teams by tracking employee progress and generating insights based on behavioural data. These analytics help HR managers offer personalized feedback and coaching while ensuring that decisions align with organizational goals (Muridzi et al., 2024). AI also assists in career development by identifying skill gaps and recommending tailored training programmes, allowing HR professionals to refine learning and development strategies (Gupta et al., 2023).

Compensation and benefit management is another area where AI enhances efficiency. AI-powered payroll systems analyse market trends, process salary calculations and suggest compensation adjustments, but final decisions remain under human supervision to ensure fairness and policy compliance (Haesevoets et al., 2021). AI also plays a role in employee engagement by assessing survey data and behavioural trends to identify potential turnover risks, helping HR leaders implement strategies to improve retention (Dutta & Mishra, 2024).

Trust is a crucial factor in human-AI collaboration. Employees are more likely to engage with AI-driven HR tools when they understand how AI contributes to decision-making rather than replacing human judgment (Lee et al., 2021). This idea aligns with recent regulatory efforts such as the EU AI Act, which classifies AI systems used in HR-related decision-making as high-risk (Annex III). To ensure trustworthy AI deployment, Article 13 of the Act requires that users be given meaningful information about the intended purpose, limitations and performance of the system, promoting transparency in decision-making. Additionally, Article 14 mandates human oversight mechanisms that allow users to interpret AI outputs, detect anomalies and override decisions when necessary. These provisions underscore the importance of transparency and accountability in fostering employee trust and verifying the fairness of AI-driven processes.

Indeed, research suggests that AI works best when it complements human expertise, allowing organizations to benefit from a combined intelligence model where AI provides data-driven insights and HR professionals ensure ethical and strategic alignment (Rodgers et al., 2023). Furthermore, companies that adopt AI responsibly by preserving human oversight and emphasizing collaboration will create more agile and effective HRM practices (Simón et al., 2024). Ensuring a structured and transparent human-AI partnership will be key to maximizing the potential of AI in workforce management.

### 3.5 Implications for scholars and practitioners

#### 3.5.1 Scholarly implications

This study contributes to the literature by systematically reviewing AI applications in HRM, using a PRISMA-based methodology to ensure a structured and reproducible review process. Distinct from previous works, where many literature reviews have not followed PRISMA, this research adopts a rigorous selection process, enhancing the

reliability of its findings. Additionally, some existing studies often rely on varied databases, conference papers and books, some of which lack strict scientific validation. By focusing on peer-reviewed journal articles indexed in Scopus, this study provides a more robust synthesis of the role of AI in HRM. The findings highlight the need for context-specific AI frameworks, emphasizing the interplay between technical capabilities, organizational culture and human adaptation strategies. Scholars should further explore AI-driven HR transformations by integrating behavioural science insights to understand employee reactions, ethical considerations and organizational change mechanisms.

### 3.5.2 Practical implications

For HR professionals, this research provides actionable insights into integrating AI into HRM practices. Managers should focus on enhancing AI transparency and trust, ensuring that employees understand the role of AI in decision-making. The study also underscores the importance of upskilling HR teams to make use of AI-driven analytics for talent acquisition, employee engagement and workforce planning. Furthermore, organizations must balance AI-driven efficiency with ethical considerations, establishing governance frameworks that mitigate bias and uphold fairness in AI-based HR decisions. Additionally, companies should invest in human-AI collaboration strategies, fostering a workplace culture that aligns AI adoption with employee well-being and organizational objectives.

## 4 CONCLUSION

The present study systematically reviewed the integration of AI in HRM using the PRISMA methodology, ensuring a structured and transparent selection of studies published between January 2019 and February 2025. By analysing peer-reviewed articles from Scopus-indexed journals, this review provides a comprehensive understanding of the role of AI in HR functions such as recruitment, performance management, employee training and workforce planning. The findings highlight the ability of AI to enhance efficiency, automate complex HR processes and support data-driven decision-making, while also revealing critical concerns related to transparency, ethics and workforce adaptation.

Despite these insights, certain limitations must be acknowledged. The review focussed on studies from a specific period and database, potentially excluding relevant research from other sources. As AI continues to evolve, future research should expand the scope to include diverse databases such as Web of Science and assess the impact of AI across different cultural and organizational contexts. Furthermore, ethical concerns, particularly regarding algorithmic bias and data privacy, require deeper investigation to ensure fairness and responsible AI implementation in HRM.

New research should also explore the economic implications of AI adoption in HRM. While AI promises efficiency gains, its long-term cost-effectiveness, especially for small and medium-sized enterprises (SMEs) remains unclear. Future studies should assess whether AI-driven HR systems provide measurable financial benefits and improved workforce outcomes. Another underexplored area is the integration of AI with evolving workplace models, such as hybrid work and decentralized organizations. Research should examine how AI can optimize HR functions in increasingly flexible work environments. Moreover, the potential of AI in automating compliance with labour laws and HR regulations warrants further exploration, particularly in industries with complex and evolving legal frameworks.

By addressing these challenges, future research can guide organizations in adopting AI responsibly, ensuring that its integration into HRM maximizes efficiency while upholding ethical standards and employee well-being. A balanced approach, making use of the analytical capabilities of AI while preserving human oversight, will be crucial for shaping the future of AI-driven HRM in a sustainable and equitable manner.

## ADDITIONAL INFORMATION AND DECLARATIONS

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**Data Availability:** The data supporting this study's findings are available as Online appendix at <https://aip.vse.cz/attachments/000049.xlsx> and is also available on the webpage of this article.

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