

---

## ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT: APPLICATIONS, OPPORTUNITIES AND CHALLENGES

---

**Amarachi Onwuzuruike**

Department of Industrial Relations and Personnel Management,  
Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

---

### Abstract

*Artificial intelligence (AI) drives efficiency in human resource processes. Consequently, Organizations are rapidly adopting this technology. When repetitive tasks are automated, the employee has more time to focus on strategic and creative task performance. There are measurable opportunities and challenges of the application of this technology in human resource management. The opportunities however surpass the challenges.*

---

**Keywords:** *Artificial intelligence, Human Resource Management, Applications, Opportunities and Challenges.*

---

### INTRODUCTION

Artificial Intelligence (AI) offers new opportunities for Human Resource Managers in talent acquisition, using algorithms that determine the best way to track applicants and job advertisements, construct evaluations of applicant ranking, automate the assessment of CVs and applications, and maximize the number of applicants applying for each job posting. Meanwhile, AI provides support throughout the subsequent stages of employment, creating individual HR strategies, employee development plans, and skills, and knowledge test plans (Faqihi & J Miah, 2022). AI affects a company's productivity by only letting it schedule the job vacancies for the skills most urgently needed, on the one hand, and on the other, adjusting their work to the company's needs in terms of competences and work experience in certain fields. AI provides various functions: in the so-called chatbots are used. These programs provide users with direct HR assistance in various HR activities like recruitment, assessment, or payroll, hence facilitating communication with the company. AI tools for production and analysis of surveys and information acquired with employees in social media for example- are other examples of AI tools aimed at boosting employee satisfaction measurements with company activities.

Technological advances are bringing long-anticipated paradigm shifts in how organizations manage their human resources (HR) including recruitment, training, retention, and management. The use of artificial intelligence (AI) in HR Management is soaring due to its ability to learn from data and improve its operating practices serving multiple business sectors which range from healthcare, banking, and manufacturing to construction and other services (Nosratabadi et al., 2022). There are several ways in which AI-driven HR practices contribute to effective management of human capital such as improving satisfaction levels of employees, cutting down costs, and enhancing the productivity of an organization. As claimed by many scholars and research-evidence, AI

offers an unmatched opportunity to recognize employee career paths, assess CV ranking, measure the eligibility of a candidate, trigger the recruitment model that uses prediction and match calculations to refer to CVs to job-specific requirements and propose only relevant applicants, and identify trends in employee work performance and productivity through sentiment analysis, voice biometrics, wearables, and other methods (Xie, 2022).

### **UNDERSTANDING ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT**

The introduction of digital technologies in human resource management processes, for example, the digitization of learning, changes in the format and digitalization of the recruitment process, and the automation of HR services contribute to the development of the digital HR trend. From the point of view of the digital competencies of staff and organizational changes, executive management of company acquire certain new technical “rules” and strategies that ensure the use of AI systems with the aim to remain competitive and to support the growth of efficiency of organization. Therefore, recent research of specialists, who are carrying out analytics of HR management issues using intelligent systems or dependent systems of automation, reflects the transition of leading companies from an era of limited HRM automation technologies to newer values in the context of digital transformation using intelligent systems (Kabengele Mpinga et al., 2022). In conditions when a lot of HRM practitioners do not possess sufficient knowledge connected with usage of AI systems in HR management, the digital transformation of domestic companies is quite active and growing, in large state-owned enterprises, small businesses and large regional holdings. Artificial Intelligence are trained to analyze and derive knowledge from external inputs to accomplish specified tasks by adjusting to the circumstances (Kaplan & Haenlein, 2019)

Process of strategic human resources assessment in the organization includes key stages such as formation and comparison of the capacity and competencies of company’s employees (V. Kubryak et al., 2022). The cognitive characteristics are studied after the stage of employee selection and recruitment and are used to make decisions involving personnel and staff of the company, such as vocational guidance, personnel examination for certification or re-qualification, interpretation of professional examination results, planning of vocational training and professional development of staff, vocational guidance counseling etc. Artificial intelligence (AI) can be effectively used for the purpose to facilitate the estimation of cognitive characteristics of an individual. In practice the usage of AI in a human resource management with aim of staff optimization, forecast and management of staff turnover and labour demand, reaching of high potential and new candidates research in a labour market is implemented in a different way such as matrix estimation, models from machine learning (Maghsoudi et al., 2023). The use of deep machine learning has expanded, which allows it to be more effective in cases where data is subjective or is generated by human behavior, small sample size, mixed and incomplete data. The logical consequence of this trend is the increase in staffing analytics capabilities to standards close to data science standards. As automation requires interpreting data, learning, and reaching conclusions, the first widely known profession in which it was used is staffing, through AI for personnel selection. Therefore, the effects of introduction of AI into human resource management at organizational and individual levels in the long term require evidence-based assessment, as in this case.

#### **Definition and Types of Artificial Intelligence**

The Research and Development (R&D) labs are characterized by top-tier academic and industrial facilities, which enhance the use and affordability of Artificial intelligence

technologies. Artificial intelligence technology used to showcase feet of autonomous cars, substitutes for human umpires, and insurance underwriters. In business organizations, AI has spawned similar opportunities. A rich variety of Artificial intelligence technologies is widely used for recruiting and training employees, retaining talents, and for automating HR processes (Choi et al., 2023). Some tools provide feedback on recruiting insights via video interviews. Artificial intelligence has been posited as an intelligence assistant that senses and interprets consumers' intents and problems. AI technologies with CEO talents increase the productivity, make strategic planning, deepen employee engagement or outsourcing, and reinforce relationships with staff or delegates to train fibers. The Chief Executive Officer (CEO) with the aid of the executives and many large shareholders frequently chastised the salary and number of staff.

Artificial intelligence is a multidisciplinary field of science and engineering to design and the hypothesis that humans' essential intellectual skills can be realized through machines by synthesizing generalizations from enormous amounts of data and replicating their ability to substitute people (Pachegowda, 2023). AI systems are inherently adaptive and transformative. The system might use inductive reasoning to understand the specific instances and examples. In Artificial intelligence, tasks could be identified and classified according to the different degrees or levels of abstraction requisite to accomplish the task. Machines or systems that have high-level scoped design tasks can carry out each of the five tasks or functions mentioned (Chen, 2023). Furthermore, Artificial intelligence can substitute for human judgments or skills because Artificial intelligence technologies have been made to address and solve a particular form of business need or expected individual creative expression.

### **Applications of Artificial Intelligence in HR**

Human Resource Information System (HRIS) includes Human Resource Management Systems (HRSWs) to manage the recruitment process, e.g., Taleo, and HR management system/enterprise resource planning systems, e.g., SAP, which are used to manage HR functions related to staff, can monitor employee performance management, employee training and corporate policies, and used for predictive workforce analysis and employee engagements and employee's different analysis which can help to improve people management. An AI Bot is used for assistance and support service to employees on corporate and welfare facilities, for example, easily accessible by employee, vacation, and leaves request via AI Bot (Varghese et al., 2022). Talent Supply Chain Management software (e.g. Upwork, LinkedIn, Fiverr) uses algorithms to match freelancers to clients; while for freelancers the main goal is to help them to manage their online work and be paid adequately; for clients, the goal is to find the right freelancer to do their job digitally with AI support and minimize remote collaboration failure, and making corporate operational cost more effective, e.g., Google Meet is used by HR for employee performance, training, interviews, and corporate process. HR becomes less human-dependent, which increases the efficiency, accuracy, productivity, and free-ups more time for HR for strategic activities like talent management, training and improving people management skills.

Today, software is increasingly being employed to reach all professional levels of every functional area of HRM, from staffing to staff withdrawal in the organizations. AI-based HRSWs use expert systems to choose relevant profiles, shortlisting, and weighting curriculum vitae before any human has a look. In curriculum vitae shortlisting, NLP tools are used to identify and extract highlights of the CV to determine the right match with respect to presented job specifications and organizations requirement and rank them for further

shortlisting and save time of HR professionals, which can lead to recruitment resource optimization (Kabengele Mpinga et al., 2022).

### **OPPORTUNITIES OF AI IN HUMAN RESOURCE MANAGEMENT**

When repetitive tasks are automated, the employee has more time to focus on strategic and creative task performance. Thus, AI offers an opportunity to expand human intelligence, foster new perspectives, breaking deadlocks, and infusing diversity. As described by Sheng et al. (2018), AI offering new insights and inspirations enabled from extended intelligence helps in the resolution of knowledge related problems.

The recruitment of the right employees is the most strategic aspect of human resource management. Talent management and supporting HR tasks are some other opportunities that HR functions can grab from AI. In talent management, due to AI, it has become easier to place the right individuals with the required skills in the right positions. Moreover, AI also helps in retaining and developing talent at an individual level, aids in increasing employee engagement and fosters creativity. Integration of AI models with employee data allows HR practitioners to optimize several crucial HR decisions related to talent management, such as hiring, turnover, pay, and performance, which ultimately helps in maximizing employee and organizational success. The integration of AI allows an organization to manage a large amount of data from all HR functions and details of all interactions among players in the HRM process to identify, develop, and retain talent.

The impact of AI in the field of human resource management is rapidly increasing. AI models are being integrated more and more with HR processes, tools, and software (Nosratabadi et al., 2022). For instance, recruitment systems are using such AI models to filter and rank candidates by utilizing several decision-making algorithms (Rožman et al., 2022). Similarly, chatbots are being used to conduct interviews rather than involving human resources personnel in the interview process (Varghese et al., 2022).

### **Efficiency and Automation**

Automation began as an important technique in the early 20th century to considerably reduce the amount of repetitive and drudgery work and then it was also moved to HRM. In Human Resource Management, an adequate number of manual or computational methods have been employed to automate jobs (Jain et al., 2022). HRM automation will cause a sustained rise in the stress in HRM because of less workload and head count. HRM automation will bring certain advances to work but also has essential strengths. There are robust principles of introducing an advanced technology such as AI in HRM that may be employed in other fields of study, given that the pressing points are explained in detail. Both administrative and cognitive HRM activities will be automated as the understanding of AI and its advantages increased. All these acclaimed benefits will shape the upcoming HRM field which we need acknowledging the expense and implementation errors, specifically for businesses, to be resolved.

The implementation of AI technologies in HRM is often facilitated by the expectation that they can lead to enhanced capacity in performing HRM tasks, that is, the enabling effect of AI on HRM (Maghsoudi et al., 2023). Even though AI enables HRM tasks such as recruitment and selection to be performed more efficiently and error-freely, only in a limited number of instances, AI can perform tasks such as investment-related portfolios (re)organization and wage determination, given that the transactional nature of HRM is gradually losing importance. Eventual resources and time have been reduced due to AI

support for HRM activities which has even improved the HRM team's ability to concentrate on strategy formation rather than managing day-to-day operations (Varghese et al., 2022).

### **Data-Driven Decision Making**

Another important AI application area that has had an impact on the decision-making and data management area in HRM is predictive analytics. Predictive analytics are part of statistical techniques that analyze complex data to identify the likelihood of future outcomes based on historical data and then drive decision making. Recruiting and selection, promotion, learning and development, career and succession planning are some of the subheadings that have been wide open to AI through predictive analytics. In terms of recruitment, companies face significant problems in terms of the transparency and objectivity in the process and AI solves these problems more effectively. Ethics and surveillance key take part in this solution after being subjected to striking scrutiny around data privacy, surveillance, technology biases, and care ethics. The use of predictive analytics has been particularly widespread in the United States and is likely to further expand due to the ongoing increase in work incarceration and the increased importance of regulatory compliance (Kabengele Mpinga et al., 2022). AI-based decision-making and management of data inherently carries risks. An example risk is that the expectations about the effect of a system do not come true. AI offers services that may seem clever but prove ineffective to the users over time while it is functioning effectively at an early stage. AI can access and manipulate historical data even without a user's knowledge. Information governance is a broad area including policies related to data management, and every organization has its own settings according to their needs. It may be hard to control the actions of the organization involving governance, and high-quality data is required to ensure the success of AI applications, but it creates that by usage. These applications can be damaged in terms of the fact that a standard data quality management plan cannot be put into practice.

As AI capabilities have grown, it has the potential to change the world of decision-making and data management in all areas of the business as well as within HRM including topics such as compensation, productivity, and recruitment by using the data which are available in any organization, and the data generated during HR processes (Maghsoudi et al., 2023). These systems use historical data to identify patterns and potential outcomes of various courses of action but do not have the capability to make decisions. In other words, AI puts the accumulated experience to good use and processes vast volumes of data at high speed to identify and assess risks, acquire new customers, or detect fraud. Similarly, the especially practical bands of AI in HRM including pattern detection and personalized information and HR Chatbots are one of these useful applications, and they offer faster service and individualized solutions, which plays a significant role in employee satisfaction and crisis management (V. Kubryak et al., 2022).

### **CHALLENGES OF AI IN HUMAN RESOURCE MANAGEMENT**

Further, job displacement is another significant downside of AI in the HR domain. As per McKinsey Global Institute's collection of research in 2019, it is estimated that almost 59 million skilled jobs could be replaced by AI within the coming 5 years, and similar amount of labor would be needed to adopt AI skills and abilities (Chen, 2023). Therefore, it is necessary for HR managers to enhance the skills of their subordinates for the acceptance of these AI-based systems and to get new jobs. Kelly (2018) suggests that HR managers should give comprehensive knowledge to their workforce so that they can easily understand new technologies and accept them positively.

Besides, ethical, and legal concerns are also some major challenges of AI in human resource management. According to Borges and Elzarka (2021), there are many laws and rules which protect some personal information that HR professionals give to AI or automatize the HR process. Alder (2020) asserts that AI-based algorithms in human resource management tend to get biased. Baum (2020) also explore that AI can be the most unsafe if the fairness, accountability, and transparency of data are not checked and controlled. Such kind of biasedness can be due to the discrimination created by human while designing and filleting the data of AI (Faqihi & J Miah, 2022). However, the role of HR is to be sure about the real-time fairness and accuracy of AI for making unbiased decisions, says Johnson & Lee (2020). Headhunting with AI contains many errors and according to the theoretical belief, it is the black box model; therefore, Redman and EHow (2018) believe that the transparency and accountability of headhunting data need a deep analysis. Furthermore, Alder (2020) iterates that the transparency of AI is also an alarming factor creating hurdles in its adaption and acceptance.

Undoubtedly, Artificial Intelligence is offering amazing opportunities for human resource management; nevertheless, it brings challenges as well (Jain et al., 2022). One of the main concerns in this regard is the technical competence of HR professionals. According to Torney, Grote, and Berger (2018), HR professionals are not aware of AI adoption in the HR domain, resulting in bad policies. The study by Alvdj, Shkurko, and Le (2020) also reveals that it is not just a matter of technical barriers; it is also a problem of fundamental infrastructure and resources as well. The existing policies, rules, and procedures are quite demoralizing factors which need to be changed.

### **Ethical and Legal Concerns**

According to Bankings (2021), the growing utilization of Artificial Intelligence is causing apprehensions and ethical dilemmas regarding its reliability particularly when AI implementation affects individuals' privacy. Jain et al., (2022) on the other hand stated that another serious concern is bias in AI. Bias in an AI system is usually systematic errors, and these errors can affect different groups of people unequally. Authoritarian governments and large corporations have applied significant resources toward automating the surveying of citizens and customers including some who should not be surveilled. By now it is folklore that tech companies have allowed differing levels of abuse of their technology by liberal democracies versus authoritarian regimes to which extent these differences can be captured by a few ethical principles is controversial, and it serves to remind us that the enhancement of either state capacity or of corporate power in open societies has the potential to erode democratic values. Finding a way forward without creating massive technical debt, as traditional mechanisms of checks and balances are bypassed and scrutiny lags technological development, is one of humanity's greatest difficulties. Bounds on unethical surveillance of individuals being democratically reviewed are ultimately going to be challenged by false positives, which in the long term can only be mitigated by ethical and policy safeguards. An increasingly hierarchical social order beginning with AI's increasing manipulation is a theme that our culture will need to negotiate more explicitly across different systems of government and governance.

Ethical and legal concerns about the use of AI in HRM parallel the ethical and legal concerns with the use of AI in society at large (Kabengele Mpinga et al., 2022). For example, AI is fundamentally a tool for making and justifying decisions. Using AI in HRM involves determining which decisions can be automated and how closely the AI system is supervised made by a human. Decisions that have the potential to significantly affect the individual

need to be made and validated by a human, such as the promotion or firing of an employee. Other decisions with lower individual impact, such as ranking the candidates for a position, may be primarily made by AI, and only looked at briefly by a human. There is then the question of legal liability which is compounded by the increasing volume of litigation centered on AI-based decision making. How the responsibility for bad decisions is allocated is regularly debated, and the decision often boils down to how convenient it is to pursue litigation under different jurisdictions. Entire sub-disciplines have been developed in AI ethics, AI law, and more recently AI rights and regulation of trading in AI in informal markets (Liu et al., 2021).

### **Job Displacement and Skills Gap**

However, predictions can also offer data which already seems outdated following the advancement of recent technology. Thus, OECD affirms that the automation of half of the world's jobs is both not true and not possible by 2025. However, the same predictions caution that 14% of all jobs in the universally economically involved nations can vanish in the coming years. According to World Bank, other perspectives suggest that up to 47% of all jobs can be the object of interest for technological advancement. Some assessments are less drastic and estimate that 9% of all tasks in the developed economies are under threat, while 40% in Japan and 46% in Slovakia are at risk, according to PwC. Based on the available research, we can also share the Pearson and Oxford University's take on the matter. Their futuristic vision for the future of work postulates that 70% of all professions will be redundant by 2040. It is then deduced that automation will spark competition and affect wages, especially those in saturated workers markets or skilled jobs.

The concrete and unbiased information I was able to gather from the available research corroborates the effects of automation and AI on employment (Xu et al., 2023). For instance, the Brookings Institution in the US found in 2019 that 36 million low-skill jobs in the country are highly susceptible to automation, whereas more complex, cognitive professions such as writing, accounting and graphic design are nearly invulnerable to AI taking over. Analysis from the consultancy firm McKinsey shows, comparatively, that 62% of the tasks in the agriculture, poultry, hunting, forestry, and fisheries industries are highly automatable. And analyzing the country of Japan, researchers at Chuzin University of Commerce found that advanced technologies such as robots and AI put jobs at high risk which correspond to 41% of the population of the country. Many more examples can be found where the circumstances are directly observable; OECD averages state that only 10% of jobs in the EU have a high risk of automation.

### **CONCLUSION**

While the evolution of Artificial Intelligence in HR is now accepted, organizations must invest and make this daring digital transformation by considering the changing times and the growing benefits of moving from a reactive HR to a proactive and predictive HR. Training is a requisite and a need for awareness and understanding of Artificial Intelligence, machine learning and neural networks among HR staff to educate AI to leverage its powers and leave decision making to HR professionals. Additionally, AI chatbots must not just cover the bases of HR's policy and procedures, but also impart soft skills training to imitate human resources improving the ultimate outcome (Kabengele Mpinga et al., 2022).

After considering the pros and cons of incorporating AI in HR functioning, one can confidently claim that the opportunities surpass the challenges. In fact, many of the challenges have go-arounds, with proper awareness, training and adoption of the right

technology, and alignment with organizational strategy, culture, and goals (Raman et al., 2024). The big data analytical capability of AI substituting for intuition and guesswork in people management, the ability to assist managers in strategic decision making, cognitive and emotional intelligence training by chatbots and improved employee experience are all powerful pluses that bode well for more widespread use of AI in HRM (Choi et al., 2023). Among others, there are the potential advantages of removing human bias in people processes, attending to employee mental wellbeing and enhancing imitation human resources, thereby reducing firms' operational frictions and transaction costs, especially in the emergent gig-economy workspace.

## References

- Bankings, S. (2021). The ethical use of artificial intelligence in human resource management: a decision-making framework. *Ethics and Information Technology*, 23(4), 841-854. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9398809/>
- Faqihi, A. & J Miah, S. (2022). *Designing an AI-Driven talent intelligence solution: exploring big data to extend the TOE framework*. <https://arxiv.org/pdf/2207.12052>
- Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my mind: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence. *Business Horizons*, 62(1), 15-25
- Nosratabadi, S., Khayer Zahed, R., Vitalievich Ponkratov, V., & Vyacheslavovich Kostyrin, E. (2022). *Artificial intelligence models and employee lifecycle management: a systematic literature review*. <https://arxiv.org/pdf/2209.07335>
- Xie, F. (2022). *Human resource data integration system based on artificial intelligence environment*. [ncbi.nlm.nih.gov](https://www.ncbi.nlm.nih.gov)
- Kabengele Mpinga, E., K Z Bukonda, N., Qailouli, S., & Chastonay, P. (2022). Artificial intelligence and human rights: are there signs of an emerging discipline? A *Systematic Review*. [ncbi.nlm.nih.gov](https://www.ncbi.nlm.nih.gov)
- V. Kubryak, O., V. Kovalchuk, S., & G. Bagdasaryan, N. (2022). *Assessment of cognitive characteristics in intelligent systems and predictive ability*. <https://arxiv.org/pdf/2209.11761>
- Maghsoudi, M., Kamrani Shahri, M., Agha Mohammad Ali Kermani, M., & Khanizad, R. (2023). Unveiling the collaborative patterns of artificial intelligence applications in human resource management: A *Social Network Analysis Approach*. <https://arxiv.org/pdf/2308.09798>
- Choi, S., Kang, H., Kim, N., & Kim, J. (2023). How Does Artificial Intelligence Improve Human Decision-Making? Evidence from the AI-Powered Go Program. <https://arxiv.org/pdf/2310.08704>
- Pachegowda, C. (2023). *The global impact of ai-artificial intelligence: recent advances and future directions, A Review*. <https://arxiv.org/pdf/2401.12223>
- Chen, Z. (2023). *Collaboration among recruiters and artificial intelligence: removing human prejudices in employment*. [ncbi.nlm.nih.gov](https://www.ncbi.nlm.nih.gov)



- Varghese, M., Raj, S., & Venkatesh, V. (2022). *Influence of AI in human lives*. <https://arxiv.org/pdf/2212.12305>
- Rožman, M., Oreški, D., & Tominc, P. (2022). *Integrating artificial intelligence into a talent management model to increase the work engagement and performance of enterprises*. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
- Jain, R., Garg, N., & N. Khera, S. (2022). Adoption of AI-Enabled Tools in Social Development Organizations in India: An Extension of UTAUT Model. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
- Liu, R., Gupta, S., & Patel, P. (2021). *The application of the principles of responsible ai on social media marketing for digital health*. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
- Xu, G., Xue, M., & Zhao, J. (2023). *The relationship of artificial intelligence opportunity perception and employee workplace well-being: A Moderated Mediation Model*. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
- Raman, R., Venugopalan, M., & Kamal, A. (2024). *Evaluating human resources management literacy: A performance analysis of ChatGPT and bard*. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)