

Artificial Intelligence in Human Resource Management

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Abstract: *Artificial Intelligence (AI) is increasingly present in organizations. In the specific case of Human Resource Management (HRM), AI has become increasingly relevant in recent years. This article aims to perform a bibliometric analysis of the scientific literature that addresses in a connected way the application and impact of AI in the field of HRM. The scientific databases consulted were Web of Science and Scopus, yielding an initial number of 156 articles, of which 73 were selected for subsequent analysis. The information was processed using the Bibliometric tool, which provided information on annual production, analysis of journals, authors, documents, keywords, etc. The results obtained show that AI applied to HRM is a developing field of study with constant growth and a positive future vision, although it should also be noted that it has a very specific character as a result of the fact that most of the research is focused on the application of AI in recruitment and selection actions, leaving aside other sub-areas with a great potential for application.*

Keywords: Artificial Intelligence

I. INTRODUCTION

The supposed “Fourth Industrial Revolution” or “Industry 4.0” has introduced intelligent technologies like Artificial Intelligence (AI) the increased development of information and communication technologies (ICT) allows phenomena like AI to greatly influence different parts of society becoming one of the most relevant elements of all possible changes in various aspects of life in this era.

Although different departments of multiple organizations have adopted or integrated AI-based tools, the Human Resources (HR) department still cannot implement them.

Despite there being many people in the HR department of organizations that recognize the importance of applying AI, they also point out that they have not taken any actions regarding this. This is a reality that shows that even though AI in the HR area is still a developing revolution and is mostly limited to large companies it is already unstoppable.

Due to the relative novelty of this technology and its application in different areas of the organization, many of the scientific developments in this field have mostly occurred in recent years. For this reason, although AI has been presented as a powerful tool in HRM, academic research on the subject is not very extensive.

Artificial Intelligence (AI) can help usher in a new era of human resource management, where data analytics, machine learning and automation can work together to save people time and support higher-quality outcomes. As AI technology moves beyond automation to augmentation, companies may be looking at how AI tools can make the work of human resources (HR) better for employees and job seekers. It's not just about saving time; it's also about providing information, insights and recommendations in near real-time.

These conversations are happening as the workforce is undergoing a major change. According to a global study from the IBM Institute for Business Value (IBV), surveyed executives estimate that 40% of their workforce will need to reskill as a result of implementing AI and automation over the next three years. This shift is viewed as an expansion of job possibilities. In fact, 87% of respondents believe employee roles are more likely to be augmented than replaced by generative AI, with the effects varying depending on job function.

This transition will have a direct impact on HR departments as companies look to fill roles that perform augmented tasks and workers seek new jobs as their own functions change. AI adoption into HR technology has the potential to assist HR teams in this new landscape. Emerging AI tools are rapidly advancing past efficiency and becoming tools for

innovation—something that frees up team members to think about HR more strategically while still providing a human touch.

II. METHODOLOGY

The methodology used was bibliometric analysis using the Bibliometric application. This tool was developed by Aria and Cuccurullo to carry out comprehensive analyses of the scientific mapping of a topic. It is an open-source tool to perform a comprehensive analysis of the scientific literature. It was programmed in R language to be flexible and facilitate integration with other statistical and graphical packages. Bibliometric enables the structured analysis of large amounts of information to infer: (a) trends over time, (b) which topics are being investigated, (c) changes in the boundaries of disciplines, etc.

The first step was to determine the databases to be used for the document search. The databases being queried were Web of Science and Scopus, as they are currently the most relevant within our research field.

The search keywords on both bases were “Artificial Intelligence” and “Human Resources” in the search field (Article Title, Abstract, and Keywords AI-based HRM applications can bring about significant changes in human resource management practices. However, previous researchers have observed a substantial gap between the promise and reality of AI in HRM.

Based on all this, the choice was justified because (1) it had the highest number of publications on the issue, (2) it had an interest in the topic, and (3) the previous literature does not correspond to the current technological level.

Subsequently, the scientific fields selected for the query were (1) Business, (2) Management and Accounting, (3) Arts and Humanities, (4) Social Sciences, (5) Economics and Finance, and (6) Psychology and Research Management. These areas were chosen since they were directly related to our current scenario.

The scientific fields that could contribute the least to research, such as physics, biology, medicine, etc., were eliminated. The analysed works were those written in English to cover a larger number of publications.

A. How HR departments are using AI

AI use in HR refers to the deployment of machine learning (ML), natural language processing (NLP) and other AI technologies to automate human resources tasks and support decision-making. It enables a data-based approach to talent acquisition, employee advancement and retention that seeks to mitigate bias and enhance the job seekers’ and employees’ experiences.

AI tools have the capabilities to assist HR leaders in a wide range of areas, including the following:

- Employee records management
- Recruitment and hiring processes
- Payroll processing
- Performance management and assessments
- Benefits administration
- On boarding new employees
- HR support or service desks

Companies today have the potential to use artificial intelligence in HR functions and processes to inform decision-making, make interacting with HR easier for employees and free up time to make better hiring decisions and invest in employee satisfaction and retention

These are some possible use cases:

Professional learning and development: Where do workers see themselves in five years? AI has the potential to assist in recommending personalized training modules for career mobility. By analysing data on each employee, such as their skills and preferences, AI could tailor their training according to personal goals. AI could also have the potential to help HR managers identify hidden talent or identify employees ready for promotion.

Candidate sourcing and hiring: A common complaint about the hiring process is that it’s slow. AI can help pick up the pace by helping managers nurture each potential hire automatically, and it allows them to receive notifications when a candidate applies for an open position.

Procurement of short-term workers: AI in HR can help organizations fill open positions quickly, including short-term and temp positions. By using natural language processing (NLP) capabilities, AI tools for HR can automate manual procurement tasks, saving HR team's valuable time for planning strategic initiatives and meeting client needs. For example, AI tools can help managers compile requirements from stakeholders and then work within a vendor management system (VMS) system to open a request with suppliers to find potential contractors and schedule interviews with hiring managers.

On boarding: AI can make the process of collecting information smoother and more personalized. AI-powered chatbots can guide new employees through the on boarding process, answer questions, provide information and send reminders about key documents—reducing time-consuming tasks and enhancing the new hire experience.

Automating HR service: Responding to employee needs is key to improving engagement and productivity, but navigating through complex corporate policies and HR and IT support processes can leave employees struggling to find answers—causing frustration and wasting time. AI-powered HR chatbots can help empower employees with fast answers and self-service support.

B. Benefits of AI in HR

If companies begin to use AI in HR to achieve more strategic goals, they may be able to see advanced benefits as well. Here are some examples:

- **Enhanced employee support:** In 2022, one in four employees was experiencing burnout symptoms, according to a global survey from McKinsey Health Institute. This poses a challenge to employers vested in worker satisfaction and performance. For teams that want to better understand their employees to improve job satisfaction and performance, AI can be a useful resource if used in a responsible way.
- **Increased efficiency:** As noted above, automation and generative AI tools can save HR teams time by taking on routine task work. AI can also be a helpful source of data sets for reviewing processes and digging deeper into how HR staff can make more informed decisions or streamline work. For example, AI can help analyse the outcomes of recruiting efforts, allowing recruiters and hiring managers to identify and refine their most successful outreach strategies.
- **Enhanced candidate experiences:** Along each step of the recruitment process, from hiring to on boarding, AI can help managers save time and better reach top talent. For example, managers can prompt generative AI tools to create customized messages that are automatically sent to each candidate. These messages can encourage engagement and move candidates along in the hiring process.

C. CHALLENGES OF AI IN HR

AI is a disruptive technology that comes with some challenges and things to keep in mind:

- 1) **Reskilling:** AI and automation can eliminate certain types of work traditionally performed by people and could impact the roles of some employees. Tackle this challenge head on with a plan for reskilling talent and restructuring job roles in a way that's empathetic to employees undergoing these changes.
- 2) **Employee privacy:** Using AI to optimize processes and evaluate performance could raise concerns. Employee privacy should be taken seriously and addressed in a data management strategy before AI systems are used to collect and analyse personal data. Let employees know what data is being collected and used for AI systems. Creating or using an AI system founded on transparency is a first step towards helping to address privacy concerns.
- 3) **Bumpy rollouts:** Organizations should be prepared to evolve AI models and continue to optimize processes. Initial rollouts might result in less-than-desired employee experiences and require tweaking. Companies should have the flexibility to change and adjust as needed.
- 4) **Cybersecurity:** AI is susceptible to hacking, especially during the training pipeline where ML algorithms are created. Data poisoning attacks seed malicious code or information in the training sets, potentially infecting countless ML model runs and, ultimately, the company network. Business leaders should work alongside IT and security operation centres (SOCs) to create plans that will keep AI projects secure throughout their entire lifecycle.

D. IBM AND AI TOOLS FOR HR

HR leaders face multiple challenges: evolving employee expectations, a global labour shortage and a global growing skills gap. Generative AI presents a new opportunity for HR leaders to re-imagine and modernize the HR function, build and retain a future-ready workforce, and foster the innovation needed to help the business meet its broader strategic mission and objectives.

Current tools and processes often fall short of what is needed to manage the massive skill shift that AI will bring. IBM Consulting and IBM Watson offer a unique combination of AI technology and talent expertise to help organizations upskill their workforce and operating models for the future. Our solutions and methods seamlessly participate data into AI-powered workflows, re-imagining work and employee tasks while also upholding trust and compliance with the highest ethical, privacy and regulatory standards.

Drawing upon our extensive industry expertise, a human-centric approach to business design, and a dedication to transparent and ethical AI, we work with our global clients and an ecosystem of partners to unlock the untapped potential of employees and secure a competitive edge that sets organizations apart.

III. CONCLUSION

The most relevant conclusions derived from the results obtained and their analyses are:

There has been an extraordinary development in technology in recent years, especially AI. Despite its development, importance of its impact in the HRM field has not been as expected. AI application in HRM is a very specific field of study, since most of the research has focused on its application in the recruitment and selection of personnel, besides important functions like training, development, or personnel rotation.

There is indeed an increasing interest in talent and the recruitment of highly qualified personnel, which is necessary for facing the changing environment and high competition. But it should be noted that talent must not only be found, but also maintained and developed to turn it into a competitive advantage. For this reason, it is essential to use AI technologies in other functions and extract the maximum added value from each process.

Based on the results obtained, it can be seen that there are still fears and negative feelings in HR employees and managers about the AI application. These feelings can complicate or slow down the use of AI in this area. Although technology has strongly disrupted the labour market and has helped create new businesses and develop existing ones, it has also eliminated many others, thus causing greater concern. But it should be noted that AI technologies need people for their proper management. Despite being faster, working 24 hours a day, optimizing time and tasks, etc., AI does not have the essential soft skills for any work environment.

Like any new technology, AI has its strengths and weaknesses. This makes it essential for HR departments to carry out an effective AI implementation strategy to integrate it safely within organizations, thus eliminating the potential damage. It is obvious that in the long term, the use of disruptive technologies will no longer be optional but rather necessary to remain competitive among other organizations.