Library Progress International
Vol.44 No.3, Jul-Dec 2024: P.20101-20108

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Changing the Momentum from Men to Machine: An empirical Study of Role of AI (Artificial Intelligence) in Human Resource Operations

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How to cite this article: Bidya Dash,Amita Panda,Sagar Bhadange,Ajay Singh (2024) Changing the Momentum from Men to Machine: An empirical Study of Role of AI (Artificial Intelligence) in Human Resource Operations. *Library Progress International,* 44(3), 20101-20108.

Abstract

The rise of Artificial Intelligence (AI) has revolutionized Human Resource (HR) management, transitioning from traditional human-driven methods to technology-based systems. This empirical study investigates AI's impact on enhancing HR operations by automating routine tasks, streamlining decision-making, and boosting efficiency in areas such as recruitment, employee engagement, performance management, and learning and development. Through data gathered from HR professionals across various industries, the study examines the level of AI integration into HR functions, the perceived advantages, and the challenges encountered during its adoption. Shifting from Men to Machine highlights the deep transformation in industries as AI increasingly takes over roles once performed by humans. As the momentum shifts from men to machine, the emphasis turns to leveraging AI's potential to optimize performance while maintaining a crucial balance between automation and human oversight. A sample of 251 was collected from HR professionals. The factors that identify the Role of AI (Artificial Intelligence) in Human Resource Operations are Recruitment and Talent Acquisition, Employee Engagement and Retention, Learning and Development (L&D), and Workforce Planning.

Keywords: Artificial intelligence, Innovation and Adaptability, HRM, Machine learning

Introduction

In today's competitive landscape, human resources are a vital asset for driving organizational success. To outperform competitors and increase productivity, organizations must adopt advanced HR practices. By utilizing AI tools and technologies, HR professionals can streamline operations, improve decision-making, and foster a more engaging and inclusive workplace. As organizations increasingly integrate AI into HR functions, maintaining a balanced approach that addresses ethical considerations and ensures human oversight is crucial to maximizing positive outcomes for both employees and the organization **(Ahmad et al., 2023).** Artificial Intelligence (AI) is transforming companies and the way innovation management is structured. As technological advancements accelerate and AI increasingly replaces traditional organizational methods, management may need to reimagine the entire innovation process **(Haefner, et al., 2021).** Artificial Intelligence (AI) is increasingly influencing the field of human resources (HR), transforming several key aspects of HR management. HR managers are responsible for finding and hiring the best talent, and integrating AI into HR processes can significantly enhance these efforts. One of AI's most notable impacts is the automation of routine tasks, such as resume screening and selecting candidates for interviews **(Ilic, Djuric, & Ostojic, 2023).** AI is increasingly replacing routine tasks in HR functions, requiring less human intervention while delivering superior outcomes,

such as reducing turnover rates and improving talent retention. Many companies are leveraging artificial intelligence and machine learning in their HR departments, where AI plays a key role in recruitment, selection, hiring, performance analysis, data collection, real-time information delivery, and providing accurate insights **(Bhardwaj, Singh & Kumar, 2020; Mittal et al., 2023).** The integration of artificial intelligence (AI) has dramatically transformed the recruitment process, greatly improving both efficiency and speed. AI-powered automation tools can swiftly process and analyse large volumes of resumes, streamlining the shortlisting process and ensuring that the most qualified candidates are identified quickly. This use of advanced technology has substantially reduced the time required for tasks that were traditionally labour-intensive and time-consuming, often taking several weeks to complete. Now, with AI, these tasks can be finalized in just hours or days, allowing companies to remain agile and responsive in an increasingly dynamic job market. AI systems could streamline the onboarding process by automating administrative tasks, provide personalized training programs based on employee learning styles, and monitor employee engagement through sentiment analysis and feedback mechanisms **(Nain & Shyam, 2024).**

Literature Review

AlQahtani (2023) studied that the role of artificial intelligence (AI) is rapidly expanding across multiple industries, and its impact on human resource management is deep. By leveraging AI technologies, HR professionals can enhance efficiency, improve decision-making, and optimize processes that were traditionally time-consuming and prone to human error. In recruitment, beyond recruitment, AI can also help match internal talent with open roles by analysing employee skill sets, performance metrics, and career development courses, making it easier to nominate the most suitable employees for internal promotions or transfers. When it comes to employee training and development, AI offers powerful insights. By tracking and analysing employee performance during training programs, AI can provide human resource supervisors with detailed feedback on the effectiveness of these programs.

Kumari & Hemalatha (2019) highlighted that artificial intelligence (AI), a specialized branch of science and technology, has been actively applied across various fields for over 60 years, and its influence continues to expand. While AI is transforming industries worldwide, human resources (HR) is no exception. As a core function within every organization, HR management plays a vital role in shaping the workforce, and it is increasingly clear that those involved in HR must develop a deep understanding of AI and its potential applications. A growing body of research suggests that organizations should prioritize the consistent implementation of AI technologies in various HR management functions.

Anitha, Shanthi & Sam (2021) revealed that AI technologies are becoming essential to human resource departments, where they assist in a variety of functions aimed at reducing turnover rates. One of the most significant applications is in turnover prediction, where neural networks analyse employee data to identify patterns and predict potential departures. By recognizing early warning signs of disengagement or dissatisfaction, organizations can take proactive measures to address these issues before they escalate. Additionally, AI-driven recruitment processes streamline candidate engagement, employing interactive voice response (IVR) systems to facilitate communication and keep applicants informed throughout the hiring process.

Abdeldayem & Aldulaimi (2020) found that artificial intelligence (AI) is ushering in a significant transformation in business management, particularly in the domain of human resources (HR) and employment. Its integration is not just a technological upgrade; it represents a fundamental shift in how employees engage with their work and how organizations manage their workforce. For HR departments, having a foundational understanding of AI and its applications is crucial. This knowledge equips HR professionals to navigate the complexities of modern workforce management and address the challenges that large organizations face today, such as high employee turnover and the need for enhanced employee engagement. By providing valuable insights to management, HR can drive strategic initiatives that align with organizational goals and enhance overall performance.

Saxena (2020) stated that technological advancement extends to the Human Resource (HR) department, which is also experiencing significant changes as a result of AI integration. Today, HR professionals are increasingly recognizing the importance of optimizing the synergy between human talent and automated systems to create a more intuitive and efficient work environment. This shift emphasizes not only the operational efficiency that AI brings but also the enhancement of the employee experience. By leveraging AI tools, HR can streamline workflows, automate routine tasks, and provide data-driven insights that improve decision-making.

Chattopadhyay (2020) stated that AI is revolutionizing how HR managers approach candidate screening,

fundamentally altering their selection processes and operational strategies. The integration of AI in recruiting involves applying artificial intelligence technologies—such as machine learning and problem-solving capabilities—to enhance the recruitment function. This innovative technology is specifically designed to streamline and automate various aspects of the recruiting workflow, particularly repetitive and high-volume tasks that often consume significant time and resources. Using resource wisely is also important for sustainability **(Srivastav & Mittal, 2021).**

Kharde (2023) revealed that Artificial Intelligence (AI) refers to technology that empowers machines to think, learn, and execute tasks traditionally performed by humans. In recent years, there has been remarkable growth in AI, significantly impacting various sectors, including information technology, where it facilitates quicker and more informed decision-making. AI is equally transformative in the field of Human Resources (HR). HR recruiters have begun integrating AI software to enhance their recruitment processes and establish a more effective selection framework. The distinction between modern HR practices and traditional human resource management is stark, as AI technology has introduced numerous efficiencies and innovations. Therefore, AI is playing a pivotal role in reshaping HR functions, allowing for a more data-driven and efficient approach to managing talent. **Soni (2022)** highlights that AI has proven to be a transformative force in our lives, revolutionizing everything from the automation of repetitive tasks to the enhancement of human capabilities. Today, HR professionals are increasingly focused on optimizing the synergy between human and automated workflows, striving to create a streamlined and intuitive work environment. This integration allows them to allocate more time to enhancing employee performance and engagement. As such, AI-based HR applications are invaluable assets for organizations seeking to improve their operations and decision-making processes. By leveraging AI, HR can enhance productivity and drive performance, making it a crucial component of modern business strategy **(Yadav et al., 2023).**

Basnet (2024) found that in today's business environment, the integration of technology—especially Artificial Intelligence (AI) and Machine Learning (ML)—has shifted from being a mere option to an essential requirement for organizational survival and growth. This paradigm shift has not only optimized business operations across various sectors but has also sparked a revolutionary transformation in Human Resource Management (HRM). In the dynamic realm of HRM, the convergence of AI and ML is emerging as a powerful force with significant implications. This technological evolution is fundamentally reshaping how organizations manage their human resources, making HRM more effective and strategically aligned with business goals. **Kumar & Thakur (2023)** studied that artificial intelligence (AI) plays a crucial role in ensuring the long-term sustainability and competitive advantage of businesses through its numerous positive impacts. It enhances various HR functions within an organization, such as employee engagement, performance evaluation, and more. This study discusses the significance of AI in relation to different HR activities, highlighting the potential of these emerging technologies for the future of organizations. As technology advances daily, there is a growing imperative for HR professionals and organizations to adapt to these developments. AI automates many human processes with minimal human intervention, demonstrating its value across HR functions like recruitment, selection, and performance assessment.
Mohand, Rosario & Esperanza (2021) stated that artificial intelligence (AI) has fundamentally transformed the way employees and managers operate, particularly in the recruitment process. As machines increasingly take over tasks that can be automated, HR professionals are empowered to assume more strategic and intellectual roles. AI significantly influences several aspects of human resource management, and the development of AI-enabled HRM systems. Additionally, AI contributes to enhancing employee emotional well-being in AI-powered workplaces.
Tripti & Pooja (2019) found that by introducing a layer of perception to HR operations, artificial intelligence (AI) is set to dramatically transform talent management. In today's era of human-machine collaboration, where technology enhances human capabilities, AI is fundamentally reshaping how businesses approach various HR functions, particularly in the domain of hiring, onboarding, and employee management. AI's introduction into talent management is not merely about improving efficiency; it is about fundamentally transforming the employee experience. By automating routine tasks, personalizing onboarding, and providing data-driven insights, AI equips HR professionals with the tools they need to foster a more engaging and supportive work environment. This shift allows HR departments to focus on strategic initiatives that drive organizational success, ultimately reshaping the future of work in profound and meaningful ways.
Alsaif & Aksoy (2023) revealed that artificial intelligence (AI) plays a pivotal role in human resource

management (HRM) within today's competitive business landscape. With its capacity to automate routine tasks, streamline processes, and deliver tailored solutions, AI has the potential to significantly enhance HRM practices. The integration of AI technologies into HRM practices is transforming how organizations manage their workforce.

Objective

To identify "Role of AI (Artificial Intelligence) in Human Resource Operations"

Study's Methodology

251 respondents are considered for this study which was collected from people working in Human Resource department. Random sampling method was used to collect data and examined by "Explanatory Factor Analysis" for results.

Findings of the Study

Below table shows demographic details of participants it shows that male participants are 52.59%, and female participants are 47.41%. Looking at the age of the participants, 34.66% were between 32 to 38 years of age, 29.08% were between 38 to 42 and 36.26% were above 42 years of age. With regards to sectors, 35.46% were from Banking & Finance sector, 37.05% were from Hospitality sector, and 27.49% were from healthcare.

Details of Participants

Variable	Participants	% age
Gender of Participants		
Male	132	52.59%
Female	119	47.41%
Total	**251**	**100**
Age in years		
32 to 38	87	34.66%
38 to 42	73	29.08%
Above 42	91	36.26%
Total	**251**	**100**
Sectors		
Banking & Finance	89	35.46%
Hospitality	93	37.05%
Healthcare	69	27.49%

Total	**251**	**100**

"Factor Analysis"

"KMO and Bartlett's Test"

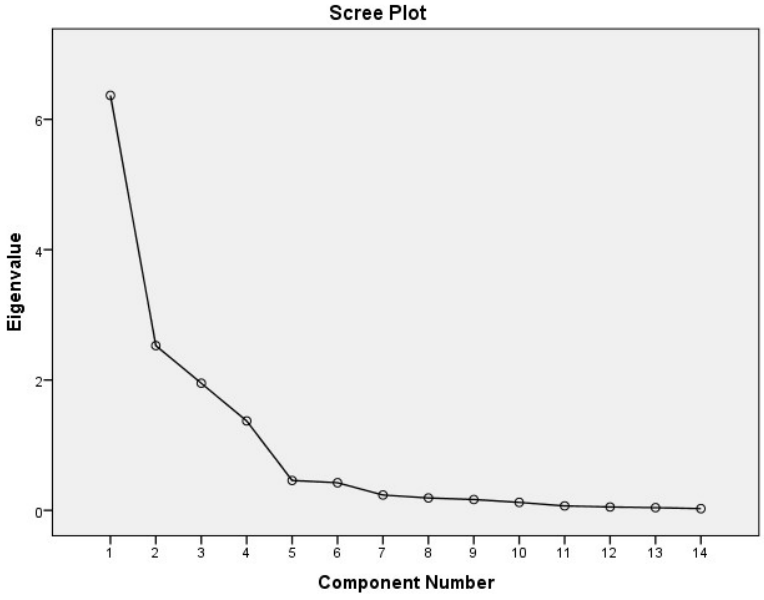
"Kaiser-Meyer-Olkin Measure of Sampling Adequacy"		.780
"Bartlett's Test of Sphericity"	"Approx. Chi-Square"	4245.497
	df	91
	Significance	.000

"KMO and Bartlett's Test", value of KMO is .780

"Total Variance Explained"

"Component"	"Initial Eigenvalues"			"Rotation Sums of Squared Loadings"		
	"Total"	"% Of Variance"	"Cumulative %"	"Total"	"% Of Variance"	"Cumulative %"
1.	6.367	45.479	45.479	**3.784**	27.027	27.027
2.	2.527	18.053	63.532	**3.663**	26.163	53.190
3.	1.951	13.934	77.465	**2.551**	18.223	71.413
4.	1.372	9.799	87.264	**2.219**	15.852	**87.264**
5.	.459	3.276	90.541			
6.	.423	3.023	93.564			
7.	.235	1.679	95.242			
8.	.191	1.363	96.606			
9.	.166	1.183	97.789			
10.	.122	.871	98.660			
11.	.068	.489	99.150			
12.	.052	.372	99.521			
13.	.041	.293	99.815			
14.	.026	.185	100.000			

All the four factors are making contribution in explaining total 87.264% of variance. The variance explained by Recruitment and Talent Acquisition is 27.027%, Employee Engagement and Retention is 26.163%, Learning and Development (L&D) is 18.223%, and Workforce Planning is 15.852%.



ScreePlot

"Rotated Component Matrix"

S. No.	Statements	Factor Loading	Factor Reliability
	Recruitment and Talent Acquisition		**.956**
1.	AI tools filter through large volumes of resumes, and filter candidates	.950	
2.	AI can match candidate profiles to job descriptions more accurately to identify the suitable candidates	.900	
3.	Chatbots handle the initial stages of recruitment, answering candidates' queries	.866	
4.	AI helps predict a candidate's success by analyzing data from previous hires	.866	
	Employee Engagement and Retention		**.965**
1.	Analyze employee communications to meter workplace sentiment and improve employee engagement	.957	
2.	Assess employee performance by analyzing data such as project outcomes, feedback, and peer reviews	.916	
3.	AI suggests personalized career development paths for employees	.901	
4.	Identify skills gaps and recommending training programs to enhance their growth	.897	
	Learning and Development (L&D)		**.881**
1.	AI tailors training programs based on individual learning styles make learning more effective	.904	
2.	Recommends courses and learning materials by analyzing performance and job role requirements	.856	
3.	Helps design gamified learning experiences, enhancing engagement and knowledge retention	.810	
	Workforce Planning		**.818**
1.	AI helps HR teams anticipate future workforce needs by analyzing business trends	.922	
2.	It enables more strategic recruitment and resource allocation	.922	
3.	Identify employees with leadership potential and suggest career paths	.606	

Factors and the associated variables

The first factor of study is Recruitment and Talent Acquisition, it includes variables like AI tools filter through large volumes of resumes, and filter candidates, AI can match candidate profiles to job descriptions more accurately to identify the suitable candidates, Chatbots handle the initial stages of recruitment, answering candidates' queries, and AI helps predict a candidate's success by analysing data from previous hires. Employee Engagement and Retention is the second factor, the variables it includes are Analyze employee communications to meter workplace sentiment and improve employee engagement, assess employee performance by analyzing data such as project outcomes, feedback, and peer reviews, AI suggests personalized career development paths for employees, and Identify skills gaps and recommending training programs to enhance their growth. Learning and Development (L&D) is the third factor, the variables that falls under this factor are AI tailors training programs based on individual learning styles make learning more effective, recommends courses and learning materials by analyzing performance and job role requirements, and helps design gamified learning experiences, enhancing engagement and knowledge retention. Workforce Planning is the last factor, the variables it includes are AI helps HR teams anticipate future workforce needs by analysing business trends, it enables more strategic recruitment and resource allocation, and Identify employees with leadership potential and suggest career paths.

"Reliability Statistics"

"Cronbach's Alpha"	"Number of Items"
.898	14

Total reliability of 14 items that includes variables for Role of AI (Artificial Intelligence) in Human Resource Operations is 0.898

Conclusion

The application of artificial intelligence (AI) technologies in human resource management (HRM) is poised to deliver significant economic advantages and fundamentally reshape the landscape of HR practices. As organizations increasingly recognize the potential of AI to enhance efficiency and effectiveness, leveraging these technologies will emerge as a critical trend in the evolution of HRM. AI comes with a lot of challenges also, and for effective AI, such challenges should also be addressed **(Mittal et al., 2024).** In conclusion, the integration of AI technologies into human resource management presents a transformative opportunity for organizations to enhance their HR practices. By improving efficiency across key areas such as strategic planning, recruitment, training, performance management, and compensation, AI is not only driving economic benefits but also fostering a more engaged and capable workforce. The factors that identify the Role of AI (Artificial Intelligence) in Human Resource Operations are Recruitment and Talent Acquisition, Employee Engagement and Retention, Learning and Development (L&D), and Workforce Planning.

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