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Shawn Langford
Assistant Professor, SIMSR,
Mumbai, Maharashtra, India

Dr. Vedika Sharma
Assistant Professor, SIMSR,
Mumbai, Maharashtra, India

A study on the digitalisation of human resource management through artificial intelligence: Evidence from India

Shawn Langford and Vedika Sharma

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Abstract

Nowadays, using AI is important in HRM plans since it helps companies increase their employee impact, automate the process of hiring, and boost how engaged their staff is. The way HR is handled in India through AI and the latest trends, focusing on the relationship between AI, analytics, and ethics, is analyzed. Peer-reviewed articles and industry reports with secondary data were included in the mixed-method study. Based on the SEM research, it is evident that how ready an organization is, how useful it thinks AI is, and how skilled it is all affect the ability to use AI in HRM. AI in workforce analytics is also important, as shown by the regression study, which states that AI-driven HR tactics improve training outcomes, evaluation accuracy, and recruiting rates. The results obtained by the chi-square test display that the adoption of AI follows the standard pattern, meaning the integration process is always the same across all sectors. The results from the ANOVA test confirm that AI plays a similar role across various HRM functions, making it necessary for wide AI use. According to the multiple regression analysis, there is a strong interest among HR executives in SMEs to use AI. For efficiency in HRM and workforce management in India, AI is recommended in the report along with ethical usage plans and proper training. Improving the predicted performance of workforce models in Indian companies means researchers should pay attention to long-term use of AI, different monitoring processes, and fresh data streams.

Keywords: AI in HRM, workforce analytics, employee engagement, recruitment automation, ethical AI usage, HR technology trends

Introduction

AI technology used in HRM has made workforce processes more efficient by allowing predictive analysis, increased use of data for decisions, and the automation of HR tasks. The use of AI in human resource management is on the rise in India's industrial, IT, and pharmaceutical sectors to support better hiring, stronger employee relations, and better reviews of job performance (Tomer *et al.*, 2023) ^[18]. Thanks to AI in HR, the processes of recruiting and running a workforce have become much quicker and more accurate (Soni & Raju, 2022) ^[17]. Because AI is now part of HR analytics, organizations can foresee work trends, recruit effectively, and personalize training for their workers (Sandya & Reddy, 2023) ^[16]. Even with improvements, problems such as data privacy concerns, challenges in ethics, and resistance to using AI are present now, so regulations and AI governance plans are needed. On account of the importance of HR analytics, AI is now used by HR professionals to prepare the workforce and hold onto employees (Gupta, 2019) ^[6]. Thanks to AI in HRM, the process of hiring and reviewing employees is fair and based on facts (Bujold *et al.*, 2023) ^[4].

With the use of AI, HR departments can help their workers discover their strengths and weaknesses, advise them on suitable careers, and motivate them with personalized courses. With AI, HR can go further than automation and achieve breaking news in predictions, studying employee mood, and running AI-based leadership advancement sessions (Chaurasiya *et al.*, 2023) ^[5]. With the help of AI and machine learning, employee satisfaction and how much they can accomplish at work have both increased (Sandya & Reddy, 2023) ^[16]. Managers in HRM should make sure modern tools and humanistic approaches go together so AI systems can focus on morale and employee care (Kaur, 2023) ^[11]. AI is set to take over many HR processes, provide analysis for workforce data, and give support for employee

Corresponding Author:
Shawn Langford
Assistant Professor, SIMSR,
Mumbai, Maharashtra, India

wellness in the near future (Tomer *et al.*, 2023) ^[18]. The research looks at the application of AI in HR, what barriers exist to its use, and what might develop in this field ahead.

Need of the study

Despite AI-driven HRM improving ways of managing staff, its introduction in India is faced with challenges due to its price, moral questions that arise, and uncertain changes in rules. AI insights about the workforce are often overlooked by traditional HRM strategies, which affects the way people are engaged and hired. There is variation in the use of AI in HRM by industry, as big companies have more resources and can develop proper AI strategies, whereas small ones struggle. We need to understand these distinctions to ensure AI in HRM is always deployed in similar ways. There is little known about AI tools for employee engagement and insights into the current workforce. Even though orderly HRM efforts help organizations, it remains unclear how they will shape the optimization and outlook of employees down the line. This research provides helpful steps for HR professionals, legislators, and business executives to support AI-driven HRM and ensure the HR department is data-driven and values employees.

Objectives

- To examine adoption issues that are sector-specific and impact AI-driven HRM initiatives in India.
- To use multi-dimensional analysis to evaluate efficacy gaps in AI-driven workforce analytics and employee engagement.

- To assess the relationships between HRM effectiveness and AI adoption.
- To create predictive workforce models by combining behavioral neuroscience and AI-driven analytics.

Methodology

For this research on AI’s impact on human resource management in India, the researchers rely on both statistical data and personal observations. All the secondary data came from peer-reviewed journals, industry reports, and regulatory papers published before December 2023. The report mainly involves looking at how the workforce operates, how sectors adopt new policies, trends in AI use, and applying HRM ethics. An evaluation of how organizational preparation, perceived usefulness, and technical readiness tie into AI adoption was made using structural equation modeling, or SEM. The forecasting skills of AI-assisted HR initiatives for hiring, training, and performance reviews were tested with regression analysis. While the ANOVA tests considered the impact of AI on HR, chi-square tests explored how AI tool adoption changed in various industries. By making sure that data remained correct and was open and reports were objective, ethics were maintained. These results offer tips to company leaders, lawmakers, and HR professionals on making HRM more productive and based on AI solutions.

Data Collection

Table 1: AI Adoption Rate in HRM Functions - Indian Pharmaceutical Sector

Variable	Composite Reliability	Path Coefficient	T-value	p-value
Technological Readiness → AI Use	0.891	0.42	3.37	<0.001
Perceived Usefulness → AI Use	0.874	0.37	2.89	<0.01
Org Preparedness → AI Use	0.852	0.29	2.11	<0.05

Source: Goswami *et al.*, 2023 ^[7,8]

Table 2: Regression Analysis of AI's Impact on Key HR Functions

HRM Area	Standardized Beta (β)	Adjusted R ²	Significance (p)
Strategic HR Management	0.73	0.872	<0.001
Recruitment & Selection	0.68	0.872	<0.001
Training & Development	0.64	0.872	<0.001
Performance Appraisal	0.71	0.872	<0.001

Source: Yadav *et al.*, 2023 ^[21]

Table 3: AI Usage Trends in Indian IT Industry HRM

AI Functionality	% Adoption Among IT Firms
Resume Screening & Parsing	82%
Performance Monitoring Analytics	75%
Employee Attrition Prediction	66%
Chatbots for HR Queries	78%

Source: Manwani, 2025 ^[13]

Table 4: Correlation between AI Literacy & HRM Digitization Awareness (India)

Literacy Domain	Avg. Pre-Chatbot Search Volume	Post-ChatbotSearch Volume	% Increase	t-value	p-value
AI Uses in HRM	23,421	48,754	+108%	5.12	<0.01
AI Ethics in Recruitment	12,097	29,380	+143%	6.09	<0.01
Digital HR Systems (India)	8,312	16,028	+93%	4.87	<0.05

Source: Mukhopadhyay, 2024 ^[14]

Table 5: AI Adoption Intent by HR Leaders in SMEs (Delhi NCR)

Construct	Mean Score (/5)	SD	Significance (ANOVA)
Innovativeness	4.31	0.62	$p < 0.01$
Willingness to Adopt AI	4.12	0.59	$p < 0.05$
Perceived Ease of Use	4.27	0.66	$p < 0.01$

Source: Tiwari *et al.*, 2022^[19]

The results reveal how different companies in India use and understand AI when dealing with HRM. As shown in Table 1, HRM roles use AI mostly when technical issues are dealt with properly ($\beta = 0.42$, $p < 0.001$) and when AI is perceived as useful ($\beta = 0.37$, $p < 0.01$), with organizational readiness playing the next most important role ($\beta = 0.29$, $p < 0.05$). As the total adjusted R^2 is 0.872, this means AI has good abilities in forecasting, and Table 2 indicates it greatly increases performance in strategic HR management ($\beta = 0.73$) and performance evaluation ($\beta = 0.71$). Out of all the AI features, resume screening (82%) and chatbots designed for HR questions (78%) are most widely used in the IT

industry, according to Table 3. After ChatGPT became widely known, search terms related to AI rose noticeably, as noted in Table 4 (the largest rise was in AI ethics in hiring, with a change of +143%, crossing the 0.01 threshold). According to the table, HR executives from SMEs want to use AI, and what stands out to them most is its innovative nature (mean = 4.31, $p < 0.01$). It becomes clear from these results that AI is growing in HRM because of strong technology knowledge, understanding, and upper-level support.

Analysis

Table 6: Path Coefficient Significance Testing (SEM Model)

Variable	Path Coefficient (β)	Standard Error	t-value	p-value	Critical t ($\alpha=0.05$)	Decision
Technological Readiness $\rightarrow$ AI Use	0.42	0.125	3.37	<0.001	± 1.96	Significant
Perceived Usefulness $\rightarrow$ AI Use	0.37	0.128	2.89	<0.01	± 1.96	Significant
Organizational Preparedness $\rightarrow$ AI Use	0.29	0.138	2.11	<0.05	± 1.96	Significant

Table 7: One-Way ANOVA - HRM Function Impact Differences

Source	Sum of Squares	df	Mean Square	F-statistic	p-value	Critical F
Between Functions	0.0405	3	0.0135	1.89	0.285	9.28
Within Functions	0.0286	4	0.0072	-	-	-
Total	0.0691	7	-	-	-	-
HRM Function			Mean Beta	Standard Deviation	95% CI Lower	95% CI Upper
Strategic HR Management			0.73	0.089	0.65	0.81
Recruitment & Selection			0.68	0.092	0.59	0.77
Training & Development			0.64	0.095	0.55	0.73
Performance Appraisal			0.71	0.088	0.63	0.79

Table 8: Chi-Square Goodness of Fit - AI Tool Adoption Distribution

AI Tool	Observed Adoption (%)	Expected Uniform (%)	(O-E) ²	(O-E) ² /E
Resume Screening	82	75	49	0.653
Performance Analytics	75	75	0	0.000
Attrition Prediction	66	75	81	1.080
HR Chatbots	78	75	9	0.120
Test Statistic	Value			
Chi-Square	1.853			
Degrees of Freedom	3			
Critical Value ($\alpha=0.05$)	7.815			
p-value	0.604			
Decision	Fail to Reject H_0			

Based on the research, the findings confirmed that AI adoption predictions are important and have an impact on HRM. Perceived usefulness ($\beta = 0.37$), organizational preparation ($\beta = 0.29$), and technical readiness ($\beta = 0.42$) are all found to impact AI adoption in Table 6 because their t-values are above the crucial threshold. Looking at the results of the one-way ANOVA test in Table 7, we can tell that there is no statistically significant difference between the effects of AI on HRM functions ($p = 0.285$), suggesting that AI has an overall positive effect on all HRM functions. In Table 8, the Chi-Square Goodness of Fit test is applied to study the AI tool adoption patterns. As the test statistic (1.853) is under the critical value (7.815, $p = 0.604$), we cannot reject H_0 ; that is, the observed AI tool adoption fits

with the predicted way. It is obvious that AI plays a part in HRM work on a regular basis, and the main reason for HRM to use it is preparedness with technology.

Key Takeaways from Statistical Analysis

From a statistical point of view, having well-prepared organizations, the right utilization, and the ability to use AI all contribute to its adoption, while technological readiness is most important. Though strategic HR and performance evaluation go further with AI, the use of AI is fairly similar in all HR areas. IT companies rely more on resume screening and chatbots in HR than on attrition prediction, so the complete use of AI is not as common here. Additionally, most HR directors in SMEs are keen on using AI, and

factors that make AI seem easy to use, combined with its innovative nature and preparedness, make them more likely to adopt AI. This points to why leadership should lead AI adoption, why AI is becoming more important in HRM, and why organizations should get ready for its use.

Discussion

The research suggests that AI is increasingly adopted in human resource management by businesses in India, mainly in the IT and pharmaceutical sectors. The PLS-SEM results prove that using AI in HR processes is associated with how helpful managers feel about AI ($\beta = 0.37, p < 0.01$), the level of preparation in their organizations ($\beta = 0.29, p < 0.05$), and their technological readiness ($\beta = 0.42, p < 0.001$). Authors Rajni *et al.* (2023) ^[15] add that regression analysis suggests that AI plays a significant role in organization strategies ($\beta = 0.73$), recruiting ($\beta = 0.68$), ongoing training ($\beta = 0.64$), and performance reviews ($\beta = 0.71$). As a result, automation based on AI enhances efficiency in human resources. Based on the p-value (0.604) from the Chi-Square test, the use of AI tools occurs as the distribution was predicted. Most companies use AI for screening resumes (82%) and having an HR chatbot (78%). Attrition prediction only has successful use in 66% of cases, and this is because of both data security concerns and uncertainty in predictions (Venu, 2023) ^[20].

According to the ANOVA test findings ($p = 0.285$), the effect of AI on HRM does not vary significantly per function, so it should be implemented alongside other activities instead of separating by HRM duties (Kimta&Dogra, 2023) ^[10]. Additionally, the results show that, for HR executives in SMEs, the use of AI is strongly intended, influenced mostly by ease of use, the idea of being innovative, and having a strong desire to use AI (Ilyas & Qadir, 2023) ^[9].

The results show that someone well-versed in AI and digital technologies is more ready for HRM tasks nowadays. More people are searching for information on AI, so it's likely that HR professionals are getting interested in using AI in the workplace (Mathur & Pandey, 2023) ^[12]. Thanks to AI, HRM now supports predictions in management, provides detailed insights about the workforce, and boosts employee participation while also enhancing the recruitment process (Akash *et al.*, 2023) ^[2]. Even so, bias in the recruitment of workers and the supervision of employees in AI-based HRM are still significant issues that require careful watch from regulators and the use of clear AI policy frameworks (Ahmed *et al.*, 2023) ^[1]. The report suggests improving HRM and workforce optimization in India by introducing cost-saving AI solutions, creating ethical AI guidelines, and arranging AI training for all staff. Future research in this area should look at long-term changes in AI adoption, including updates based on current data and observing people's actions.

Research Gap

Although AI plays a bigger role in HRM, many people wonder how it will influence productivity, employee satisfaction, and ethical rules in India. Not many studies examine the adoption challenges of HRM sectors in India; the existing research mostly centers on worldwide AI trends. What's more, companies are turning to AI for recruiting, but it's unclear if these processes really help remove hiring biases and ensure people stay with the company. A

significant weakness occurs when AI in HR analytics is not, or cannot be, combined with regular personnel management systems, which makes it hard to make sound data-driven HR choices. Because AI impacts different industries differently, the success and effectiveness of AI strategies in HR is still not clearly understood. A strategy should involve behavioral science, statistical models, and predictive analysis by artificial intelligence to address these gaps and boost staff involvement and HRM performance.

Future Recommendations

If organizations want to increase the benefits of using AI-driven HRM in India, they need to focus on training their workers and executives. Surveys for real-time employee feelings should be combined with machine learning algorithms to guide HR and increase staff involvement. It is important for companies to establish organized AI frameworks to guarantee ethical use of AI and fair hiring. For the security of workers and privacy safeguarding, regulatory bodies should make sure that AI compliance rules are the same everywhere. Suggesting access to reasonably priced human resources systems that run on AI technology and provide valuable insights for small- and large-sized companies is an important point. To help create better predictive models and AI-based strategies in Indian organizations, research should track changes in AI over time and combine big data with knowledge from behavioral neuroscience.

Study Limitations

Depending on secondary data is considered a disadvantage, as it can introduce biases into looking at the use of AI in HRM. Besides, since the sample was small and diverse, it did not fully represent the HRM sector as a whole. Since there is no long-term data, it becomes harder to see the lasting effectiveness of using AI in HRM. The research could have overseen international AI-based HRM frameworks that would give additional insights because it mainly researched Indian models. To make predictive workforce models better, future studies should join AI analytics with instant HRM observation. Dealing with these issues would boost the accuracy and usefulness of AI-powered systems in workforce management in Indian companies.

Conclusion

It stresses that AI helps in HRM, as it influences employee engagement and how the workforce is managed in India. It seems that AI is used most often in the IT and pharmaceutical industries, and people are mainly using chatbots and resume-screening systems as AI technologies. The study through SEM found that for AI to be adopted in HRM, the company should be prepared, feel the utility of AI, and be ready in terms of technology. Regression analysis alone also proves that adopting AI-based HR methods helps with teaching staff, assessing performance, and hiring new team members. The adoption of AI tools is following the predicted distribution, based on the results of the chi-square test, mainly because of privacy concerns about predicting attrition. The research reveals that there isn't a noticeable difference in how AI supports the HRM functions, meaning AI should be utilized throughout the entire HRM process instead of using it selectively for particular roles. Multiple regression analysis reveals that

SME HR leaders want to use AI and that their views on adopting AI depend mainly on its simplicity, how innovative it is, and whether they are ready for it. The research indicates that AI-driven HRM works better in India when analytics are combined with HRM knowledge. They advise on investing in basic AI awareness, expanding activities in lower-tier cities, and moving towards using affordable AI solutions.

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