

Application of Artificial Intelligence in Redefining Human Resource Management in Pune, Maharashtra

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Abstract

In this digital era, Artificial Intelligence (AI) has the potential to revolutionize the Human Resource Management (HRM) domain by optimizing operations, facilitating decision-making, and augmenting employee engagement in industrial and servicing sectors. As companies encounter escalating competition in today's business environment, AI is becoming increasingly indispensable in HRM processes. The integration of AI into HRM processes can yield a host of benefits, such as heightened efficiency and effectiveness in hiring, selection, and employee training. Moreover, AI can provide valuable insights into employee behavior, preferences, and performance, which can be leveraged to make informed decisions and enhance employee satisfaction. This study aims to explore the attitudes of HR professionals towards AI and assess the practical applications of these technologies. A questionnaire-based survey was conducted among HR managers in India during the winter of 2023, using the snowball method sampling procedure. The questionnaire predominantly comprised Likert-scale questions. The research findings revealed a mixed response from the survey participants, who were HR managers from diverse industries based in Pune, concerning the use of AI in HR practices. The respondents largely concurred that AI tools are effective and can benefit HR management. Nonetheless, the study's principal limitation is its restricted scope, as it encompasses only one nation and involves a small sample size.

Keywords: Artificial intelligence, HRM, HR function, Collaboration, Technology, Decision Making, innovation.

1. Introduction

Human resource management (HRM) is an essential function in organizations that encompasses several policies and activities. These activities primarily include the formulation of corporate HR strategies, recruitment and selection of employees, training and development, performance management, incentive management, employee relations, and activities that promote employees' health and safety. In recent years, using artificial intelligence (AI) in HRM has become a growing trend, as it is known to bring economic benefits.

Globalization has had a profound impact on the development of technology and the integration of organizational processes, spanning various sectors such as manufacturing, finance, and human resources. In the 1980s, computer-based HRM procedures experienced significant growth, paving the way for the conceptualization and development of Human Resource Information Systems (HRIS). HRIS is a systematic approach to collecting, storing, maintaining, retrieving, and validating data about organizations' human resources, personnel activities, and unit characteristics. HRIS has the potential to streamline and automate essential HR activities such as job application screening, onboarding, e-learning, training, payroll, HR reporting and analytics, and performance management.

Advancements in computer science have transformed HRM practices from mere record-keeping tools to strategic decision-making enablers. Recent technological developments have contributed to increased productivity while redefining HR roles. E-HRM, a term used to describe the control and management of all HR activities, has been adopted to reduce HR and administrative costs, increase productivity and efficiency, and allow opportunities for conducting strategic tasks. The emergence of AI-enabled systems has further accelerated the applicability of HRM, especially with the onset of the COVID-19 pandemic.

Artificial Intelligence (AI) is revolutionizing traditional HRM processes, presenting unprecedented opportunities for efficiency, effectiveness, and strategic alignment. AI is reshaping recruitment and talent acquisition by automating tedious tasks, enhancing candidate sourcing, and improving decision-making. AI-driven algorithms analyze vast amounts of data to identify top talent, predict candidate success, and optimize hiring processes. Automated resume screening, chatbot-assisted candidate interactions, and predictive analytics streamline recruitment, reducing time-to-hire and costs while enhancing the quality of hires.

AI-powered onboarding processes personalize experiences, accelerate integration, and foster engagement. Intelligent platforms leverage AI to deliver tailored content, provide guidance, and facilitate connections with peers. Chatbots assist with inquiries and automate tasks, contributing to higher retention rates. AI-powered learning solutions offer personalized, immersive experiences with VR and AR technologies. Machine learning algorithms analyze employee data to recommend relevant training content. AI-driven feedback mechanisms enhance learning outcomes and improve job performance.

AI-powered performance management systems transform performance evaluation, feedback delivery, and goal alignment. They analyze real-time data, minimize bias, promote transparency, and ensure fairness. AI technologies also foster personalized experiences, meaningful interactions, and career development opportunities. Sentiment analysis tools gauge employee sentiment and identify areas for improvement, while chatbots facilitate regular check-ins, gather feedback, and provide support. AI-driven recommendation engines suggest personalized learning paths, recognition programs, and growth opportunities, fostering a culture of continuous development and loyalty.

AI is transforming the way organizations manage their workforce. It optimizes staffing, predicts future talent needs, identifies patterns of turnover and absenteeism, and schedules shifts efficiently. AI offers HR professionals data-driven insights, predictive modeling, and valuable foresight. Advanced analytics tools analyze HR data, uncovering hidden patterns and trends. Machine learning algorithms predict future workforce needs, talent gaps, and skill requirements, empowering HR leaders to make strategic decisions. Dashboards, reports, and visualizations facilitate transparency and collaboration, driving organizational success.

This study highlights that AI is redefining recruitment and talent acquisition, employee onboarding, training and development, performance management, employee engagement and retention, workforce planning, and decision-making. AI empowers HR professionals to unleash the full potential of their workforce and drive sustainable growth and innovation. In a nutshell, embracing AI-enabled HRM practices is not merely an option but a strategic imperative for organizations seeking to thrive in the digital age.

2. Literature Review

Artificial Intelligence (AI) refers to a system that can learn and adapt on its own, meaning that programs powered by AI can create algorithms, observe patterns, and combine data without prior programming. For AI to be effective, it must be able to learn and perform in a given situation, however, it requires a significant amount of data to function optimally. Despite being called machines with human intelligence, AI cannot replace human labor as machines cannot comprehend the context of a given situation.

A study conducted by Bouchard and Wassell in 2020 postulated that Human Resource (HR) management has undergone significant development since the 1960s. The functions of HR management have transformed rapidly in recent decades, from managing document funds and employer branding to acquiring talented employees. Bondarouk and Rüel conducted a similar study in 2009, proving that technology and HR management are increasingly integrated, with terms like e-HR or digital HR being prevalent in the field since the 2000s. The integration of technology and HR management leads to more efficient human management processes and enables better quality services. The emergence of digitalization has led to new attitudes, behaviors, qualifications, and expectations in younger generations as compared to previous ones (Prensky, 2001). To cater to this new workforce, HR management needs to adapt its strategies and operations accordingly (Elia and Margherita, 2015). According to Sheila et al.'s 2018 study, the use of AI in HR management is a relatively new concept that is still in its early stages. Artificial intelligence is an interdisciplinary field that aims to artificially reproduce human abilities and intellectual behavior. Elaine Rich suggests that artificial intelligence utilizes computers for tasks in which humans are currently better, but this may change in the future.

Hintze's 2016 study argues that AI can quickly retrieve the best answer to a question asked by simulating the information process of human awareness and thinking. In the future, AI may become capable of simulating human emotions or even

developing self-consciousness. A similar study suggests that AI is the intelligence exhibited by a machine, program, or artificially created consciousness, whereas machine learning (ML) is a branch of AI that includes systems capable of learning and represents the latest techniques in statistical analysis, pattern recognition, and predictive analysis (Wilkinson et al., 2017).

In HR management, AI first appeared in the form of Human Resource Information Systems (HRIS) that automate HR management, recruitment processes, documentation, and other human management activities. According to Iqbal et al. (2018), electronic human resource management (e-HRM) positively impacts managers' work productivity and influences HR service quality, leading to better day-to-day decisions. Bhadoriya et al. (2017) state that e-HRM's effectiveness is influenced by various factors, such as management support and environmental characteristics, which affect an organization's technological perception and performance. Successful implementation of e-HRM requires collaboration between the IT and HR departments. Ruël and van der Kaap (2012) argue that the value of e-HRM depends on the efficiency, effectiveness, and quality of HR service. Marler (2016) states that the main aim of e-HRM is to automate menial administrative tasks, freeing up HR professionals to focus on developing HR policies and strategically planning business relationships. While some people believe that AI poses a challenge to HR professionals in finding a place within the organization that has been freed up due to technological advances, Kauzo (2017) argues that AI can be beneficial. The rise of automation and AI has raised concerns among labor economists about the substitutability of human workers with robots and AI technology. According to Frey and Osborne (2017), 47% of all jobs in the US may be threatened by technological advances. However, it does not mean that automation and technological development will devalue human labor. Instead, both automation and human work will complement each other, especially in creative and solution-oriented workplaces where people will remain crucial. Mokyr et al. (2015) suggest that computers and robots will bring new products and services, leading to new job opportunities.

The role of Artificial Intelligence (AI) in HR management has been a topic of discussion among researchers. Although its practical applications are still being debated, it is widely acknowledged that AI will have a significant impact on HR management in the future. One of the main advantages of AI is its ability to handle vast amounts of data simultaneously, which makes it easier and more efficient to track and analyze organizational data. This, in turn, can provide valuable support for the continuous development of human resources, particularly in the areas of workforce development and career planning.

AI has accelerated learning processes within organizations by making them more personalized. It can monitor the interests of employees and their development, making it useful in career planning. Although assessing workforce performance is a crucial aspect of HR management, it is often based on subjective criteria rather than objective criteria, which can lead to controversies and a higher employee turnover rate (Wei, 2013). The integration of AI in performance appraisal and incentive management can enhance objectivity. AI programs continually monitor and provide feedback to employees regarding the quality and quantity of their tasks. In recent times, many organizations have been struggling to attract talented workers, leading to a rise in the value of retaining skilled employees within the organization (McNulty, 2018).

AI can evaluate and analyze employee satisfaction and work-life balance, allowing predictive models built into advanced technology to forecast which employees may leave the organization in the future (Sexton et al., 2005). Employees' daily conduct and behavior provide cues about their intentions, which can enable organizations to predict their plans using statistical models. Based on this information, managers or AI can take timely action to prevent the loss of skilled employees (Grillo, 2015).

Thus, Artificial Intelligence (AI) is revolutionizing the recruitment industry by automating mundane tasks. AI tools are increasingly being utilized to speed up and make the candidate selection process more objective during the initial stages. These tools scan, evaluate, and reject applicants based on pre-defined criteria. In the future, a fully automated selection process may eliminate the need for any human intervention until the candidate has successfully cleared the program. The author has provided a summary of the current known applications of AI in HR management for each HR function

3. Methodology

The present study was initiated to gather insights from HR managers, about their attitudes and opinions towards Artificial Intelligence (AI). A survey was conducted with the help of the snowball sampling method, which involved the selection of respondents from the target population, followed by their recommendation of other relevant individuals.

The questionnaires were distributed both in paper and online formats from November to December 2023, to HR managers in and around Pune, Maharashtra, and a total of 195 valid responses were chosen out of 200 collected responses. The questionnaire comprised 25 questions, majorly of the Likert scale type, except for an open-ended question that respondents had the option to skip. To ensure the comprehensibility and relevance of the questions, pilot research was conducted with the involvement of graduate students in management organizations. The questionnaire consisted of three parts: the first part collected demographic data, while the second part assessed the attitudes and opinions of the respondents regarding AI. The third part focused on the practical implications of AI in Indian HR management.

The data collected were evaluated using the SPSS-21 statistical analysis software and subjected to a comprehensive analysis, categorization, and coding. The results of the study provide a detailed understanding of the perceptions of HR managers regarding AI, and its potential implementation in the Indian HR management system.

Based on the literature and research gap, the 2 hypotheses are proposed:

H1: There is a significant acceptance of AI among HR managers in Indian Firms.

H2: There is a positive impact of the use of AI in HRM practices in Indian Firms.

Results and Discussion:

Table 1. Demographic characteristics of respondents

	Frequency	Percent
Gender		
Male	138	70.77
Female	57	29.23
Age		
18-25	17	8.72
25-35	49	25.13
35-50	83	42.56
50-65	41	21.03
over 65 years	5	2.56
Educational level		
University degree	158	81.03
Secondary school	31	15.90
PhD	6	3.08

Source: Primary Data

Table 1 presents a comprehensive breakdown of the demographic information of the survey participants. Out of all the respondents, 70.77% were male, and the remaining 29.23% were female. In terms of age distribution, 8.72% of the participants were between the ages of 18 and 25, while 25% fell between the age group of 25 and 35. Many of the respondents were aged between 35 and 50 (42.64%), followed by those aged between 50 and 65 (21.03%), and individuals over the age of 65 accounted for the smallest percentage (2.56%). Concerning educational qualifications, 85.3% of the respondents were university graduates, followed by individuals with a secondary education (12%), while only 2.6% of the respondents held a doctoral degree.

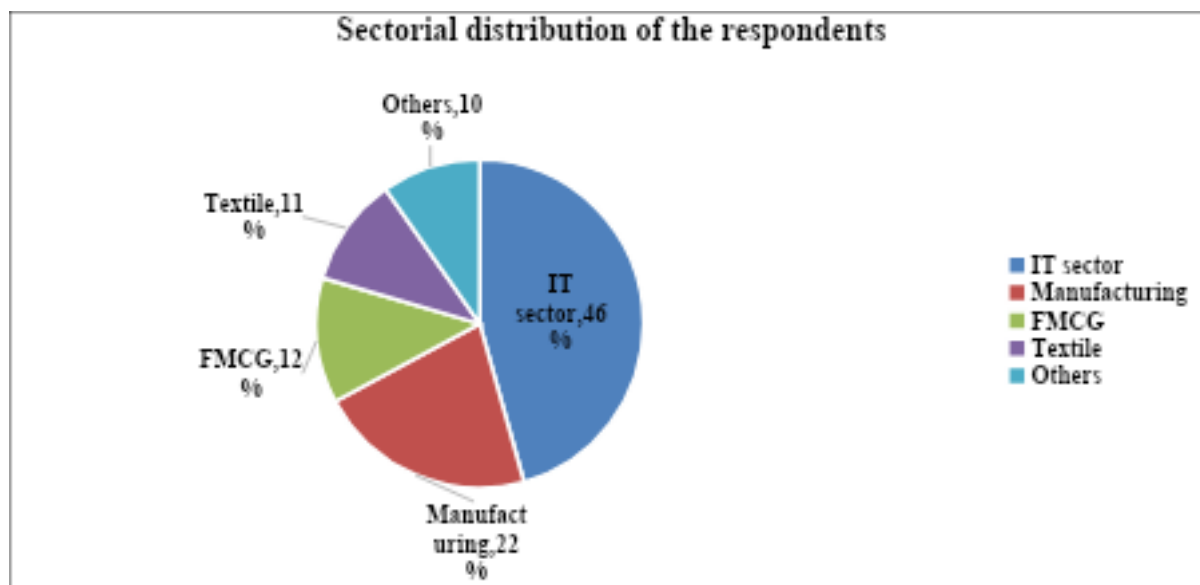


Figure 1: Sectorial distribution of the respondents

Figure 1. represents the sectorial distribution of respondents. 46% of respondents were from the IT sector, 21% of respondents were HR managers from the manufacturing sector, 12 % of respondents were from the FMCG industry, 11% were from the textile and 10% of the respondents were from another type of industries.

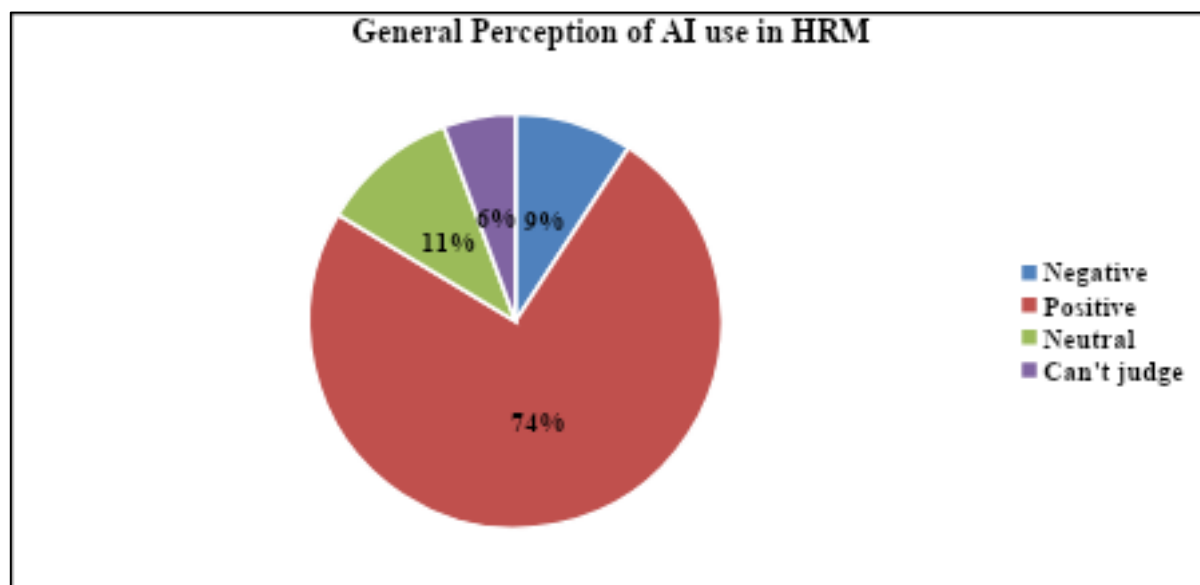


Figure 2: Perception of the Use of AI in HRM practices (in %)

The attitudes of HR professionals towards artificial intelligence (AI) were examined in our study. Figure 2 revealed that 9% of the respondents had a negative perception of the proliferation of these technologies, while 74% perceived a positive impact of AI in HRM practices. Additionally, 11% of respondents were neutral towards the impact of AI on HRM practices and 6% of the respondents said that they could not say anything about AI and its impact on HRM practices in Indian Firms. The study suggests that HR professionals have a favorable outlook on AI. However, the findings indicate that different industries hold varying opinions on AI, with IT and technical services showing more positivity towards AI, while HR professionals in other service sectors have a more negative attitude. This is consistent with earlier studies that established a strong correlation between AI usage and the field of activity. Further analysis of the primary data may provide more insights into the reasons underlying these variations in perceptions.

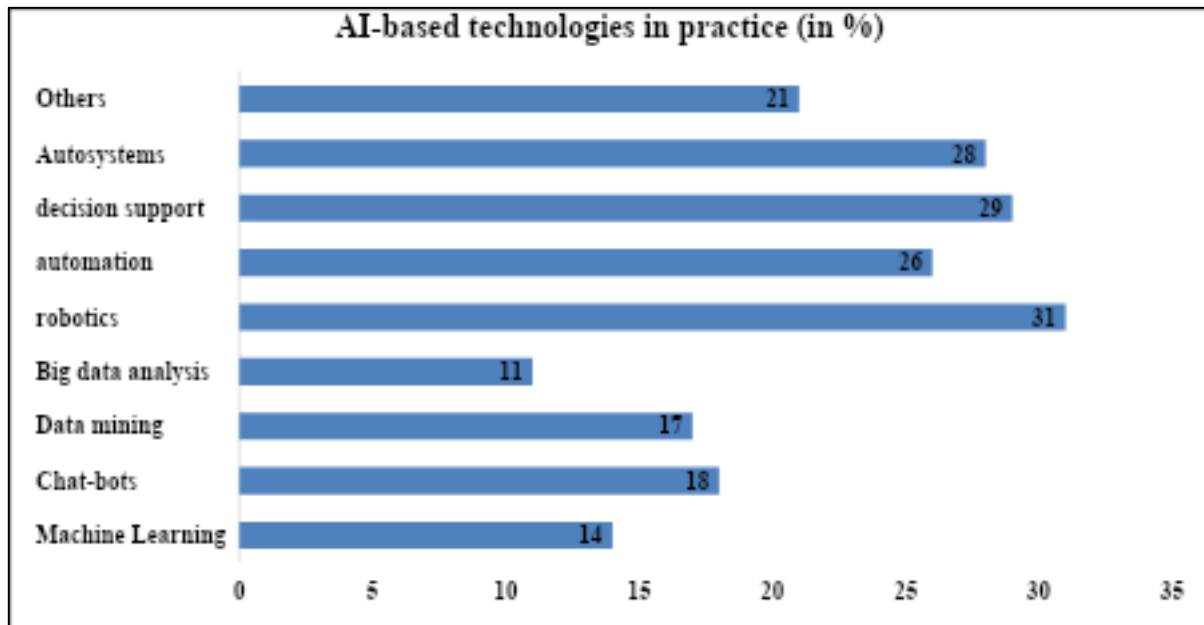


Figure 3: AI-based technologies in practice (in %)

In Figure 3, the most used AI-based technologies among practitioners have been depicted. Decision support and auto systems are the two most frequently encountered AI-based technologies in practice, accounting for 15% of the respondents' responses. These systems make use of AI-based algorithms and software in recruitment and selection, as well as for training and performance evaluation. The second most frequently encountered technology is automation in industries, which accounts for 11% of the responses. The use of robotics in HR practices accounts for 10% of the responses, while Big Data analysis and data mining account for 12% and 11% of the responses respectively. The use of chatbots and machine learning accounted for 11% and 10% of the responses respectively.

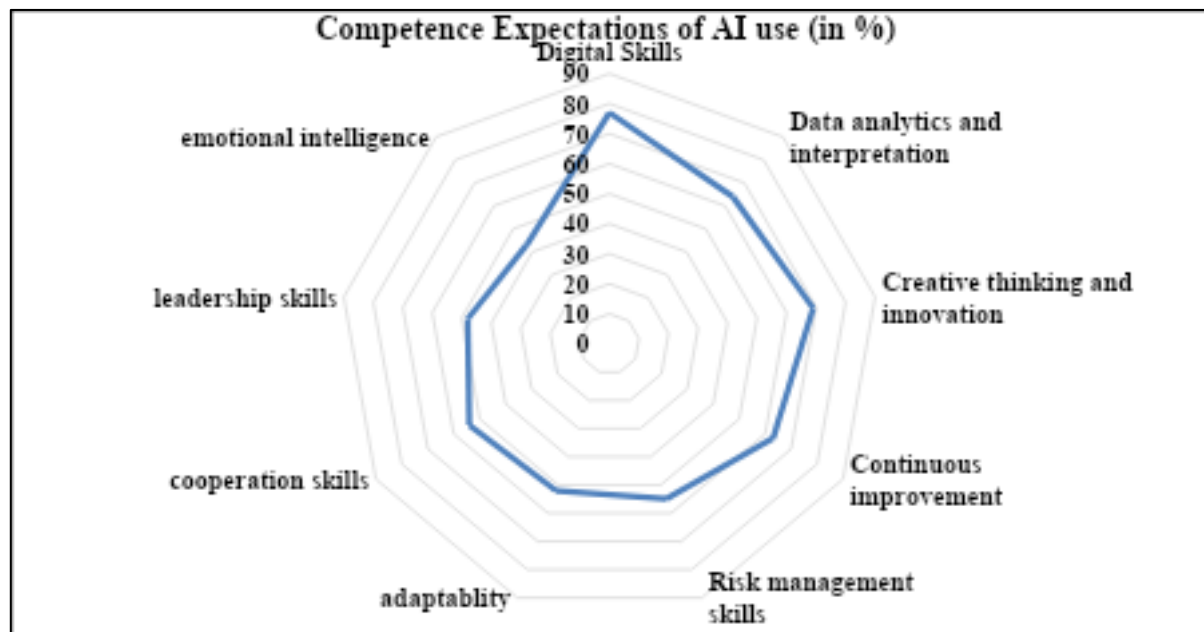


Figure 4: Competence Expectations of AI use and its usefulness for future employees

The data depicted in Figure 4 delves into the competencies that Human Resource (HR) professionals consider indispensable for fresh recruits to tackle the challenges posed by Artificial Intelligence (AI) and technological advancements. The participants were requested to identify the competencies that they believed would be most critical for future employees. The results showed that digital skills (selected by 77%) were the most crucial competency, followed

by data analysis and interpretation (64%). Creative thinking and innovation (69%) were also deemed as important competencies for future employees. Additionally, competencies such as the need for continuous improvement (63%), risk management skills (55%), and adaptability (52%) were found to be significant. Among the classic competencies, cooperation skills (54%), leadership skills (48%), and emotional intelligence (43%) were also considered essential.

Table 2: Opinion of HR professionals for use of AI in recruitment.

	Strongly disagree	Disagree	Agree	Strongly agree	Cannot judge	Summary
AI is more objective than human intelligence	18	22	56	88	11	195
AI speeds up the recruitment process	11	28	64	83	9	195
AI eases the process of recruitment	12	14	59	87	23	195
AI eases the training of recruits	10	11	59	98	17	195
AI has 100% perfection in the recruitment process	8	17	54	92	24	195

Source: Primary Data

According to a recent study, 75% of HR professionals strongly agreed or agreed that AI is more objective than human intelligence in the recruitment of new employees. However, 25% of HR professionals believed that there is no impact of AI in the recruitment process. The study also found that 78% of HR professionals either strongly agreed or agreed that AI speeds up the recruitment process while appointing a new employee. However, 22% of HR professionals believed that there is no significant impact of the use of AI on the speed of the recruitment process. Moreover, the study depicted that AI eases the process of recruitment of new employees, with 72% of HR professionals either strongly agreeing or agreeing with this statement. However, 28% of HR professionals believed that there is no impact of AI in the recruitment process. Further, the study found that 71% of HR professionals either strongly agreed or agreed that AI eases the process of recruitment while appointing a new employee. However, 29% of HR professionals believed that there is no significant impact of the use of AI on the speed of the recruitment process. Additionally, the study showed that AI eases the training of recruits while appointing new employees. However, 27% of HR professionals believed that there is no significant impact of the use of AI on the speed of the recruitment process. Finally, most HR professionals believe that AI has 100% perfection in the recruitment process when appointing a new employee. However, 20% of HR professionals believed that there is no significant impact of the use of AI on the speed of the recruitment process.

The research aims to explore the opinions of HR professionals on the use of AI in selecting new hires. The study found that HR managers perceive AI as a more objective tool than human intelligence, especially in analyzing CVs. The majority of the HR managers surveyed agreed that AI is more objective than humans in making decisions about the new workforce. This result aligns with international publications that suggest AI will play a significant role in HR management in the future.

To test the study's hypotheses, the author performed correlation calculations using variables such as AI and fear of job loss and positive perceptions of AI and its role in HR management. The study found no significant relationship between the fear of job loss and AI, but a medium correlation coefficient of 0.341 was found between positive perceptions of AI and its role in HR management. This indicates that the surveyed HR professionals have a favorable attitude toward using AI in HR management. The author further evaluated the impact of AI on HR practices in Indian enterprises and found that using AI positively impacts HR management practices in Indian enterprises. The regression analysis results revealed that AI has a considerable positive impact on Indian enterprises' HR management practices.

The impact of AI and robotics on the workplace has been a topic of extensive research and discussion. A recent study aimed to gather insights into the opinions of HR professionals regarding this issue. The study found that HR professionals view AI as a more objective tool compared to human intelligence when it comes to selecting new employees. Additionally,

the results indicated that HR professionals have a positive outlook towards the use of AI in HR management, perceiving it as having the potential to enhance HR practices in Indian enterprises.

Table 3: Results of Correlation Analysis Correlations

		<i>Acceptance of AI</i>	<i>Positive impact of the use of AI</i>	<i>AI integration in HR</i>
<i>Acceptance of AI among HR managers is significant in Indian Firms</i>	Pearson	1.0	0.054	0.247**
	Correlation	0.259	0.387	0.187
	Sig. (2-tailed)	195	195	195
	N			
<i>There is a Positive impact of the use of AI in HRM practices in Indian Firms.</i>	Pearson	0.054	1.0	0.000
	Correlation	0.287	0.211	0.047
	Sig. (2-tailed)	195	195	195
	N			
<i>AI integration in HR</i>	Pearson	0.247**	0.054	1.0
	Correlation	0.01	0.246	
	Sig. (2-tailed)	195	195	195
	N			
**Correlation is significant at a level of 0.01 level (2-tailed) Source: Primary Data				

Table 4: Statistical analysis

Regression^a (Summary Model)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.235 ^a	0.241	0.171	1.236	1.671
a. Predictors: (Constant), the positive role of AI in HRM					
b. Dependent Variable: AI					

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	36.547	1.0	35.687	16.354	0.001b
	364.214	187	1.389		
	312.356	195			
a. Predictors: (Constant), the positive role of AI in HRM					
b. Dependent Variable: AI					

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	1.365	0.137	0.3169	6.647	0.000
	The Positive Role of AI in HRM	0.348	0.094		4.0789	0.000
a. Dependent Variable: AI						
Source: Primary Data						

The statistical analysis of Table 4 indicates that AI has a positive effect on HR management in Indian enterprises. This is evidenced by the R-value of 0.235, which represents the correlation value between AI and its positive effect on HR management. The R Square value is 0.241, which means that the independent variable (AI) accounts for nearly 11% of the variance in the dependent variable (HR management). Furthermore, the Adjusted R Square value of 0.171 indicates that the model is reliable and that the independent variable plays a significant role in accounting for variation in HR management practices.

In the ANOVA section of Table 4, the F value is 16.354, and the F statistic is significant at 0.000. This means that AI plays a significant role in HR management practices, particularly in recruitment and training practices. The Beta value is 0.341 at a significance level of 0.000, which further supports this conclusion. The p-value is less than 0.05, which indicates that the independent variable (AI) predicts the variation in the dependent variable (HR management) and that the relationship between them is significant. Overall, these findings provide strong evidence to support the hypothesis that AI has a positive impact on HR management practices in Indian enterprises.

Conclusion

This study investigated the perceptions of 191 HR managers on the use of artificial intelligence (AI) in HR management. The analysis of their responses revealed that HR professionals generally have a positive view of AI and believe that its integration into HR management is beneficial. Contrary to initial assumptions, there is no conclusive evidence to support the concern that AI would lead to job losses in the future. Nonetheless, organizations must keep up with technological advancements and modernize their HR management technologies to remain competitive. Although AI may transform traditional HR management methods, it is unlikely to entirely replace human professionals. Consequently, organizations must recruit new professionals with the necessary skills and competencies and prepare existing employees for these changes. Effective communication and leadership are key to creating an open and constructive atmosphere that integrates the experiences and ideas of employees into the system. In conclusion, effective leadership is crucial for organizations to sustain their business amidst global economic challenges. Leaders who can motivate and inspire their employees are essential to enhancing organizational performance. Effective leadership fosters employee integration and collaboration with the organization to achieve its vision and goals.

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