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An Examination of the Challenges Associated with Applying Artificial Intelligence Techniques to Specific Management Problems

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Artificial intelligence (AI) holds immense promise in revolutionizing management practices across various sectors, offering solutions to complex problems and optimizing decision-making processes. However, the application of AI techniques to management problems is not without its challenges. This examination delves into the multifaceted hurdles encountered when integrating AI into management frameworks, highlighting key obstacles and potential avenues for overcoming them.AI algorithms heavily rely on large volumes of high-quality data for effective training and decision-making. Yet, many management domains grapple with disparate data sources, inconsistencies, and incomplete datasets, hindering the performance and reliability of AI systems. Furthermore, the dynamic nature of management problems poses a significant challenge to AI implementation. Management environments are characterized by evolving trends, uncertainties, and unforeseen disruptions, rendering static AI models inadequate in adapting to changing conditions. Hence, the development of agile AI systems capable of continuous learning and adaptation becomes essential for addressing the dynamic nature of management challenges.

Keywords: Artificial intelligence, management practices, challenges, data quality, disparate data sources, dynamic management problems, agile AI systems, continuous learning, adaptation.

1. Introduction

There has always been a strong correlation between technological advancements and positive

social outcomes, such as higher living standards, more opportunities, more workplace fairness, and more employee creativity. Today, control businesses are under pressure in their conventional activity[1]. Not only are there a small number of rivals, but corporations also need to constantly compete on a worldwide scale; as a result, new technologies reduce the impact on the environment. As a result, it's clear that companies need to be on the cutting edge of constantly evolving innovation. Management of results, organisational growth, learning and progression, and recruiting are all aspects of human resources [2] .

Every successful organisation relies on its people, who bring their unique set of skills and experiences to the table in pursuit of overarching goals. Therefore, it is essential to focus on issues such as hiring the proper people and offering training to help them develop their skills [3]. Because it is responsible for staffing the whole firm with qualified individuals, human resource management is an essential function of every business. The conventional methods of human resource management, such as paper-based data entry, extensive manual training, and performance evaluations, have long been used by businesses in place of more modern, cognitively demanding approaches to these functions [4]. As a result, only a small number of businesses have adopted HRM strategies that take advantage of the development of online operations. New methods of HRM are also created and tried out in large companies [5]. Research on the potential solutions and enhancements that technology might bring to human resource management (HRM) problems like as recruiting, growth, and success evaluations is scarce in recent years. The human resource management sector is now investing heavily in research and development of automated systems that are both more secure and more efficient. Addressing one of the most recent technological developments, it has been argued in some earlier works that technology diminishes the need for personal interaction. With a focus on recruiting, preparation, learning and development, success assessment, and the future of HRM with artificial intelligence intervention (AI), this study delves into the key domains of human resources management (HRM). [6].

The activities that comprise human resource management (HRM) include hiring new employees, providing ongoing education and guidance, evaluating current employees' performance, determining fair remuneration, and planning for the company's future success [7]. In India, many companies still use antiquated HR practices, such as manually sorting resumes for hiring, keeping track of employees' information, determining their training needs, conducting performance reviews, managing their time off, and assisting employees with their exit. All the necessary actions cannot be done manually by humans and often need a lot of time-focused attention from each individual recruiter. Since humans are fallible and prone to prejudice, their first assessments of situations and individuals may be inaccurate [8]. This is problematic since human resource management is increasingly important for implementing job-related redundancies (such as workers' reluctance to change, leadership's support, finding the proper talent, and acknowledging the need for employee education) and making sure that employees have the skills they need. While artificial intelligence (AI) has already carried out certain basic HRM tasks, there are still many aspects of HR management that have not been thoroughly investigated in AI intervention and HRM. In terms of reducing turnover and improving talent maintenance, machines outperformed human resource management (HRM) teams. Slowly reskill or upskill workers so they can adjust to automation, and prioritise AI tools that boost employee engagement and satisfaction [9]. Companies throughout the globe

have begun using AI, according to the researcher's comprehensive literature study; but, in India, just a small percentage of businesses have made the switch. Artificial intelligence (AI) has also received little attention in India. There has to be more future systematic experimental research on new technology that makes things easier and more accessible. Additionally, employees aren't sure whether these cutting-edge technologies will make things harder or easier for HR recruiters when it comes to human resource management (HRM)[10]. Since this is not addressed in the existing literature, it is imperative that new developments in HRM be included into overall strategy in order to shed light on the subject.

The existing state of human resource management (HRM) using artificial intelligence (AI) in the IT industry and how this can be implemented in the processes of human resource management of IT companies in India is the main purpose of conducting this research[11]. This research will explore the effect of artificial intelligence on different areas of human resource management (HRM) elaborates contemporary scenario in human resource management by providing the model to fill the gap on the way artificial intelligence (AI) can impact traditional human resource management (HRM) and possibly increase effectiveness[12].

Determining human resource management with artificial intelligence opportunities in and its impact on recruitment, training, performance appraisal and human resource management future with the relationship of artificial intelligence[13]

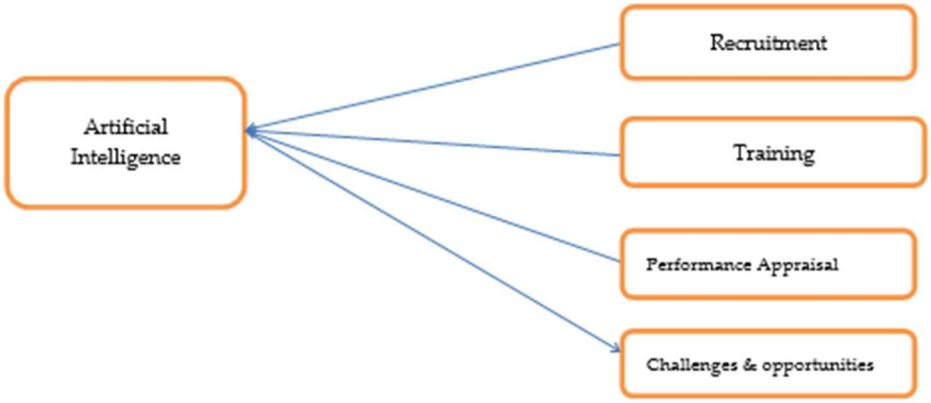

Figure 1. Conceptual Research Model

2. Artificial Intelligence in Human Resource Management

The HR practitioners today concentrate on maximising the integration of human and automatic function in order to create an easy, smooth and intuitive working environment. It offers time for imagination, intellect, and empathy to provide a quality experience for candidates and employees. The HR process may be compound, monotonous and vulnerable to human faults and distortions. Artificial Intelligence (AI) transactions with human-machine reproduction Historically, AI technology has been organised as an aid to human workers in the management of complicated and monotonous jobs in many areas. Over the past ten years, the world of

Artificial Intelligence was enormously enlarged and many complicated market issues, including HRM, had to be solved. The implementation of important AI concepts, including expert programmes, artificial learning, processing of natural languages and patterns has expanded the knowledge of the software resources used to pick, development and attract workers in all HRM processes. The definition of artificial intelligence is vast, complex and rapidly evolving. In several fields of HRM, such as talent acquisition, applicant evaluation, employee retention and employee growth there are many rising possibilities for artificial intelligence[14]

a) Steps in Recruitment Process using Artificial Intelligence

AI-based newly formed job posting tool using which that go through the resume database of a company and after filtering brings out the shortlisted candidate for the recruiter. Few more advanced tools provide many advanced features by visiting social platforms on a frequent basis and keep on adding candidate's profiles that match with the preset keywords by the recruiter[7]. This is done by the Application Tracking System. These applications use common associated search and matching algorithms to check thousands of resumes. Figure 2 below shows the workflow:

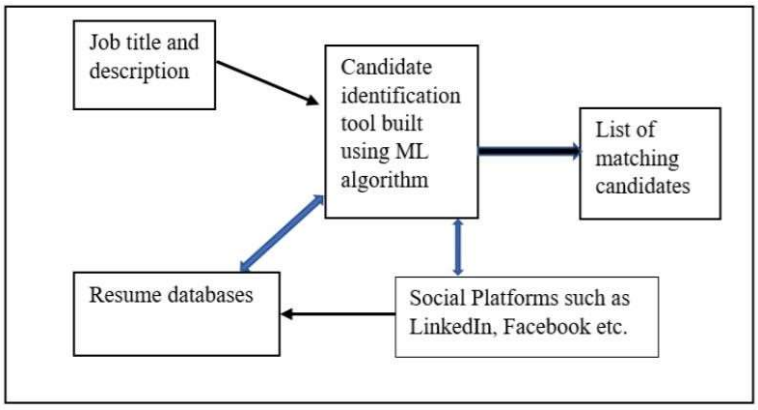

Fig 2. Steps in Recruitment Process using AI

Job aggregator software: This software interface makes it very easy for recruiters to search vacancies posted on multiple on-line portals and blogs and compile them on a single page. The main purpose of such a work aggregator programme is to identify and compile the available job list on the web and thus draw the right number of prospective candidates who can further apply for this open job. Renowned businesses use advanced versions of this form of software to build common websites for work aggregators. HR recruiters use work aggregators' websites to explicitly post their jobs[8]. They also write the work posts so that the job aggregator website notifies you of the job posting and takes it to the blog. The data analytics found on these career aggregator platforms are of great use for recruiters looking to fill highly technical vacancies if few applicants are eligible to fill jobs. The programme for the career aggregator operates much like a search engine, gathering job posts across the Internet and organising them in a searchable feed of filters for job seekers[9].

b) Role of Artificial Intelligence in Training

The role of Artificial Intelligence is a critical role in how an employee is being hired, onboarded, inaugurated into an organisation, on top of the skills training and personal development line-ups received. Furthermost conventional learning answers proposed long-layout training, like PowerPoint presentations, class room training, seminars, etc in terms of eLearning content[10]. Moreover, estimating the learning effect and preparing ROI has consistently been a most despicable aspect of L&D, which includes a really long time of information assortment and examination while the outcomes are generally unsuitable and mistaken.

Man-made intelligence is disinclined to any bias or predisposition and just depends on information to offer proposals most appropriate to the general destinations of the association. The AI in training would be a strong direction for the HR technology industry. AI would be a forum for training and growth. Providers of HR technologies are increasingly trying to place AI at the heart of every framework for handling capital resources. It is an incentive for all to use AI to build a strategic structure for learning and development[8]. AI developers seem to take a thoughtful approach towards teaching, learning, and growth in the dynamic combination of technologies, processes and corporate principles within an enterprise. HR Technologies will make this transition simple and smooth for TLD programs. Personalized coaching and growth are essential prerequisites for HR teams to successfully handle their strengths and skill gaps. Traditional L&D systems for business-centred processes are considered boring, expensive, and unconducive. TLD teams can use AI to create customized interactive learning environments that staff can navigate from any device, anytime[9]

The AI in training would be a strong direction for the HR technology industry. HR Technology is an incentive for us to use AI to design a strategic system for learning and development. AI developers tend to take a conservative approach to train, learning and growth through the dynamic combination of technologies, procedures and corporate principles within an enterprise. If an organisation wants to be at the forefront of technological development and has a budget to compete, The AI-driven training process includes loading employee chatbots and authentication data. The bot would immediately have a collection of information to help an approaching task before the employee even worries about obtaining learning materials[10]

Personalizing the Learning Experience - With AI, one can gain information from the massive amount of employee data coming in, complemented by an in-depth study, and thereby encourage the creation of personalized learning initiatives.

Virtual Mentoring - Virtual trainers use AI methods to monitor the progress of learners, as well as to analyze many mental phases of the learner's journey through instruction by estimating domain awareness and, when possible, revising the curriculum This structure will also provide feedback and instruction, enhance the productivity of learning and recommend tailored educational programs for learners.

Advanced Analytics - When all of this is compiled and analyzed, L&D leaders will reverse crucial lessons into cost planning and the growth and retention of learners. Thus, any system gaps can be reassessed and reformed.

c)Process of Performance Appraisal using Artificial Intelligence.

Artificial Intelligence enhances performance appraisal responsibilities and progressions. Review the benefits below of using artificial intelligence in performance management. Performance management, also known as monitoring employee performance, depicts the instruments and processes in place to investigate information from an organization or application's performance with the aim of finding and investigating problems. The process of automated performance appraisal tasks ensures an audit path or audit log of the sports that allows making the worried worker or supervisor responsible.

There is clarity for senior managers since the final performance assessment processes have been computerized, and HR managers will participate in dispute cases and reveal the conflict root by entering into the HR server and analysing the complaint records. Personnel will also log in and access the paper for themselves, adding clarity to the process. In the case of a lawsuit or a jail term, the whole record of events inside the HR portal will be used as evidence in a court of law for the organisations. The 1/3 incidents will also obtain access to the HR portal system, which can be helpful for the investigators to verify and assess culpability or in some other case of the multiple events, especially in cases of internal investigations.

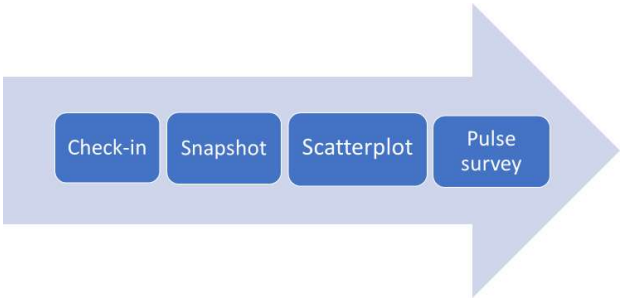

Fig 3.Process of Performance Appraisal Using Artificial Intelligence

It is shown in the above figure, the first step check-in is initiated by a team member and consist of frequent future-focused conversations between a team member and a team leader. The Second step snapshot initiated by a team member and completed by the team leader. Snap shot is the team leader's first-hand assessment of a team member's performance at a point in time. In the third step, three or more completed performance snapshots are needed to view a scatter plot. An employee can identify the highlighted performance among the overall scatter plot. The Scatter plot stage provides a quarterly view on employee's performance and empowers to track employee's progress against the desired target. Next step Pulse survey, initiated and completed by the team leader. A pulse survey is a short survey that provides team leaders with insights into performance and team engagement.

3. Conclusion

The integration of artificial intelligence (AI) techniques into management frameworks presents both immense opportunities and formidable challenges. While AI holds the promise of revolutionizing decision-making processes and offering innovative solutions to complex management problems, its implementation is hindered by several key obstacles.Many

management domains struggle with disparate data sources, inconsistencies, and incomplete datasets, undermining the performance and reliability of AI systems. Addressing these data challenges requires concerted efforts to improve data collection, standardization, and quality assurance processes.Management environments are characterized by evolving trends, uncertainties, and unforeseen disruptions, rendering static AI models insufficient in adapting to changing conditions.

Developing agile AI systems capable of continuous learning and adaptation is essential for effectively addressing the dynamic nature of management challenges.

Conflicts of Interest

The authors declare that they have no competing interests.

References

1. Hazarika I. Artificial intelligence: opportunities and implications for the health workforce. Int Health 2020;12(4):241–5. https://doi.org/ 10.1093/INTHEALTH/IHAA007.
2. Abdeldayem, M. M., and S. H. Aldulaimi. 2020. Trends and opportunities of artificial intelligence in human resource management: Aspirations for public sector in Bahrain. International Journal of Scientific and Technology Research 9 (1):3867–3655
3. Aloqaily, A., and H. N. Rawash. 2022. The application reality of Artificial Intelligence and its impact on the administrative human resources processes. Journal of Positive School Psychology 6 (5):3520–29.
4. Arslan, A., C. Cooper, Z. Khan, I. Golgeci, and I. Ali. 2022. Artificial Intelligence and human workers interaction at team level: A conceptual assessment of the challenges and potential HRM strategies. International Journal of Manpower 43 (1):75–88.
5. Basu, S., M. Bishakha, M. Kajari, M. Surender, and P. Chandan. 2022 March. Artificial Intelligence–HRM interactions and outcomes: A systematic review and causal configurational explanation. Human Resource Management Review 100893. doi:10.1016/j.hrmr.2022.100893.
6. Garg, S., S. Sinha, A. Kumar, and M. Mani. 2022. A review of machine learning applications in Human Resource Management. International Journal of Productivity and Performance Management 71 (5):1590–610. doi:10.1108/IJPPM-08-2020-0427
7. Hamilton, R. H., and H. K. Davison. 2022. Legal and ethical challenges for HR in machine learning. Employee Responsibilities and Rights Journal 34 (1):19–39. doi:10.1007/s10672-021-09377-z.
8. Jatobá, M., J. Santos, I. Gutierriz, D. Moscon, P. O. Fernandes, and J. P. Teixeira. 2019. Evolution of Artificial Intelligence research in Human Resources. Evolution of Artificial Intelligence research in human resources. Procedia Computer Science 164: 137–42. doi: 10.1016/j.procs.2019.12.165.
9. Ingole, K., &Padole, D. (2023). Design Approaches for Internet of Things Based System Model for Agricultural Applications. In 11th International Conference on Emerging Trends in Engineering & Technology - Signal and Information Processing (ICETET - SIP) (pp. 1-5). Nagpur, India.
10. Kimseng, T., A. Javed, C. Jeenanunta, and Y. Kohda. 2020. Applications of fuzzy logic to reconfigure human resource management practices for promoting product innovation in formal and non-formal R&D firms. Journal of Open Innovation: Technology, Market, and Complexity 6 (2). doi: 10.3390/JOITMC6020038.

11. Malik, A., P. Thevisuthan, and T. De Sliva. 2022Artificial Intelligence, Employee Engagement, Experience, and HRM BT - Strategic Human Resource Management and Employment Relations: An International PerspectiveA. Maliked. 171–84Springer International Publishing. doi:10.1007/978-3-030-90955-0_16.
12. Nejrs, Salwa Mohammed(2023) Medical images utilization for significant data hiding based on machine learning, Journal of Discrete Mathematical Sciences and Cryptography, 26:7, 1971–1979, DOI: 10.47974/JDMSC-1785
13. Lin, Lon, Lee, Chun-Chang, Yeh, Wen-Chih& Yu, Zheng(2022) The influence of ethical climate and personality traits on the performance of housing agents, Journal of Information and Optimization Sciences, 43:2, 371-399, DOI: 10.1080/02522667.2021.2016986
14. Johri, P., Khatri, S.K., Al-Taani, A.T., Sabharwal, M., Suvanov, S., Kumar, A. (2021). Natural Language Processing: History, Evolution, Application, and Future Work. In: Abraham, A., Castillo, O., Virmani, D. (eds) Proceedings of 3rd International Conference on Computing Informatics and Networks. Lecture Notes in Networks and Systems, vol 167. Springer, Singapore. https://doi.org/10.1007/978-981-15-9712-1_31