Review of Artificial Intelligence & Data Analytics Applications in Healthcare for Efficient Human Resource Management

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Abstract
As a department, Human Resource Management handles all the features of employees and has various functions like Planning, Organizing, Directing and Controlling. The other practices that have been follows by Human Resource Department are HR planning, directing job analysis, recruitment and conducting interviews, training, rewarding, assistance and motivation, quality of work life, HR Auditing, maintain compliances with native, state, and central labour laws, and many more. With the technological development and advancement HR has also changed its functioning and to cater the diverse organisational needs in the era of globalisation. Human resource Management is now totally based on advanced technologies like Artificial Intelligence, Big data & HR analytics. With recent developments in global health care sector the industry is undergoing with a fundamental transformation where both business volume & business value needs to be managed efficiently, these new challenges also threaten the human resources (HR) accountable for health care planning and delivery. The paper makes the attempt that current HR technology practises are unlikely to bring about transformational change in the rapidly evolving healthcare sector until HR professionals begin considering both the benefits and drawbacks of these emerging technologies and engage operationally and strategically to develop better methods and approaches.
Keywords: Human Resource, Healthcare, Analytics, Artificial Intelligence, Change Management

1. Introduction

Medical science is the area of diagnostic and treatment of illness. With the advancement in the information technology there has been a drastic development in the medical education and workforce across the world. Rapid communication tools provide the facility to communicate and disseminate the information at a very fast pace. This shortened turnaround time also facilitates the assessment and evaluation of the solutions provided on different aspects of disease and treatment, with a chance to discuss with other peer-groups located at different parts of the world through various conferencing tools. As per the report released by IBEF,2021 the healthcare market in India is expected to reach US $ 372 billion by 2023. HR is basically related to the term which reflects the most important perspective of any organisation. It is related to both the people who work and the division liable to manage resources connected to workforce in the organization. In every organization the production of the product and services have been done by the Human, the mind of the human involved in those planning of the product and services. Without the help of the employee no work can get completed in the organization. Every organization is desired to have and to work with the skilled and knowledgeable person to make their management best. However, the healthcare sector is still struggling to acquire desired talent pool equipped with technical skills to deliver the advanced healthcare services. AI is the term used to describe the technology that performs tasks like problem solving, logical thinking, and language processing. It's a tool that is used to do what a person wants to do in the working life.

It enables machines to function and think like human. Artificial intelligence uses an algorithm that links high-quality data with quick addition capabilities to improve the accuracy and stability of routine tasks. Additionally, AI technologies provide significant chances to improve the

dependability of HR processes like hiring and talent acquisition, screenings, payroll, reporting, policies, and procedures.

Artificial intelligence is expanding and having a significant impact on organisations in the modern day. Managers of human resources are confident that combining AI and HR will be advantageous for the company. A growing amount of HR data is being created in the cloud by humans and learning robots, and artificial intelligence analysis is being used to provide an enhanced understanding of how to accomplish and operate. Every organisation succeeds when the right people, processes, and technologies are put in place to reduce costs.

2. Objectives of the study

The role of healthcare HR professionals are not just limited to hire nurses and doctors. The wide-ranging staffing needs managing dynamic personnel, including training and development of employees. There is a lot more which bears the responsibility of changing HR needs.

The main objectives of the paper are as under:

- To study the various functionalities of AI in healthcare HRM.
- To study various aspects of HR manager's functioning & role of AI in healthcare sector.
- To study the challenges faced by the HR Manager's regarding AI automation in healthcare sector.

3. Literature Review

Nowadays analytics in HR is the game changer for the time to come for any business organization. (Vander Togt and Rasmussen, 2017). Josh Bersin (2018), stated in his research paper. One such sophisticated AI robot, Sophia, joined the panel for the discussion on "Artificial Intelligence in HR," which was about the AI appreciation in HR functions, and was asked questions during the United Nations Convention on Sustainable Development. He talked about the different tasks that have been handled by the HR members. These are: - vacation request, determining your mood, team training, hiring processes, smart people analytics, identifying employees on the way out, litigation strategy, pay equality, recruiting, employee learning and development, management and leadership, employee self-service and candidate management. The conclusion reached is that in order to prevent unintentionally introducing bias into their programmes, HR leaders and practitioners need to have a comprehensive awareness of how decisions are made. The AI is always evolving, either by maintaining the status quo or gradually introducing minor modifications. A different study by Petter Cappelli (2018) is titled "Artificial Intelligence in Human Resources Management: Challenges and a Path Forward." The researcher has talked about the difficulties that HR practises have encountered. He primarily focused on four difficulties – 1. One is the complexity of HR phenomena. 2. Limitations brought on by tiny data sets, 3. Moral concerns about justice and legal restrictions, 4. Management response to employees using data-based algorithms. Additionally, the researcher discussed the many phases of the AI life cycle, including operations, data generation, machine learning, and decision making. The speed of development towards specialised AI systems in the healthcare, automotive, social media, advertising, and marketing industries is significant, according to the conclusion section. According to (Vivek Yawalker, 2019), as artificial intelligence enters many areas including HR, Finance, Marketing, and Production, it aids the industry in working more effectively and efficiently to fulfil tasks.

AI can assist organisations in informing their daily operations and overall performance. The data was descriptive in nature and was derived from secondary sources such as research papers, books, websites, HR blogs, survey reports, etc. The paper's primary goal was to analyse the function and difficulties of the HR department. The Chabot, machine learning, and robot process automation in HRM that support hiring, screening, onboarding, and interviewing, among other HRM functions, were also covered by him. 2019's Jennifer Johansson She discussed HRM in her most recent research article, "The Application of Artificial Intelligence in Human Resource Management," particularly the hiring of current employees who will contribute skills and knowledge to an organisation. The study's

goal is to examine how artificial intelligence improvements in the hiring process. The study's methodology includes semi-structured interviews with international businesses from all around the world as part of a qualitative study. Thematic analysis was used to examine the data. The concluding section demonstrates how the field of AI in recruiting is young and how few businesses are utilising AI throughout the entire recruitment process. AI is employed in applicant preselection, communication with candidates, and distribution of recruiting outcomes for applications. The company's general preparation for new technology was identified as the main hurdle. Human Resource has always been significant determinant in terms of maintaining quality & cost with improved service performance in health sector (Bartram and Dowling 2013). The step towards the corporatization of healthcare industry has also developed a requirement of large pool of hospital chains whose capacity, procedures needs more equipped with professional & managerial skills, which supports the efficient delivery of interdependent jobs in an integrated multidisciplinary systems which demands for collaborative teamwork and move advanced skills to be learned by the doctors who are experts in their own domain & comfortable only in their respective specialization stream (Falkenberg 2010).

4. Roles and Responsibilities

Currently, the human resources department in healthcare is embracing the digital revolution and employing a variety of methods to streamline the resources through the use of big data analysis, artificial intelligence, and cloud computing. Organisations are utilising artificial intelligence (AI) or technologies in HR like chatbots, applicant tracking systems (ATS), machine learning, and robot process automation in human resource management to assist with recruitment, screening, on-boarding, and interviewing, among other tasks. These tasks, which were previously entirely performed by humans, are reshaped with the aid of a virtual assistant. Artificial intelligence is used in human resource management, helping hospitals by automating processes and improving patient outcomes.

The major areas of AI in Human Resource Management are:

➢ RecruitmentThe most crucial component in every organisation is finding the greatest employees. The time it used to take the recruiter to review the candidate's résumé was considerable. Artificial intelligence is implemented into systems that assist the hiring staff in analysing the resumes they receive, comparing them to those of current employees in the same job role, and then choosing the best candidate based on the results. There won't be any human prejudice because there is no human involvement. The implementation of an AI involvement system will make the hiring process quicker and less time-consuming. With artificial intelligence, websites like LinkedIn, indeed, and Naukri.com are using machine learning algorithms that also give job recommendations for the candidate based on their resumes, keywords used by candidates, their search history, and their list of connections. Recruitment, which involves posting a job ad in appropriate websites and searching for candidates, is a time-consuming process. The organisation can undertake hiring and related tasks with a 71% lower cost per hire and three times greater recruitment efficiency by using AI-enhanced software.

➢ Screening: In order to automate the interview process, artificial intelligence can analyse candidates' speech or word patterns. Digital interviews can be conducted using AI computers, and AI also adds value and enhances the candidate experience. Amy and Clara are two tools used to organise working sessions and interviews. Accepting the offer letter and beginning the on-boarding process, which is crucial for the organisation, are the final steps in the hiring process. Today, every company performs orientation programmes for all new hires using AI-based software to inform them of the organization's culture, policies, laws, and regulations.

➢ Training: An important part of the healthcare sector is training. In the healthcare industry, using artificial intelligence in training programmes has grown to be a significant opportunity. Artificial intelligence that evaluates and develops the abilities, attitudes, and behaviours of individuals working at various levels. The conventions of training programmes may be simply

created by artificial intelligence because every individual has a unique learning style and may require a different amount of time to complete a task. Employers should ask for feedback from the trainees following each training session so that any necessary improvements can be made quickly. Artificial intelligence (AI) aids both companies and employees in identifying gaps in their knowledge, abilities, personalities, and other attributes and facilitate them to proceed and give their best in their work.

➤ Performance Management: In the healthcare sector, effective performance management is crucial for higher employee retention. Because of the application of artificial intelligence, the traditional method of evaluating employee performance is declining day by day. The majority of the time, employers have biases towards the other employees, and the rate of inaccuracy was very high. With the aid of packages offered by businesses like Microsoft, Accenture, and Deloitte—companies that have been successful in delivering Artificial Intelligence tools used for evaluating the performance of the employee—many large hospitals are using AI for the improvement of the performance management system.

➤ Talent Management: Particularly in the post-pandemic age, the healthcare industry struggles to recruit the necessary expertise and skilled specialists. The most important resource for any management is people. It means that plans have been made by the company to accommodate the needs of the workers. HR therefore incorporates succession planning, talent acquisition, personnel management, etc. into its activities. By evaluating skills, identities, etc., AI devices assist in selecting the best candidate for the job. It too gathers data from unique sources, such as social media.

➤ Learning and Development: As learning and development are becoming massively replaced by AI. All health professionals must participate in ongoing learning and development programmes to advance both personally and professionally. For current and modern representatives in relation to healthcare policies and functions, there may be ongoing preparation. Learning and development can be personalised and provide patients with a more individualised experience with the help of AI. One can memorise at their convenience in this way. HR must ensure that this learning material contains insightful and significant information as well as an effective reviewing process.

5. Challenges of Artificial Intelligence in Human Resource Management:

There is a lot more which bears the responsibility of changing healthcare HR needs. With the increasing global competition and rapid technological obsolesce it has become mandatory for the hospitals to adopt the technological changes to achieve a sustainable growth with better healthcare services. Now-a-days, hospitals have increased their participation in Artificial Intelligence based Human Resource to improve their employee's skill set. Many healthcare professionals still struggle to comprehend AI tools and develop their knowledge of digital technologies. Although AI might function similarly to a human mind that trained it, it won't learn the virtues or ethics that would change its actions. It is most difficult part for HR department to handle the AI tools in the hospitals with limited application knowledge.

➤ As the technology advancement take place in day-to-day life, it will also be the challenge of the HR department to handle with these issues and overcomes and take decisions in the various healthcare services.

➤ Many healthcare organisations have struggled to create forward-looking strategic analyses because they lack the knowledge necessary to integrate big data into HR analytics programmes (CAHRS, 2014a; CAHRS, 2014b).

➤ Cost, which is the most crucial part in the organization, using AI tools and working on digital platform, with a limited skilled workforce cost of maintaining, updating, restoring and repair of AI applications would incur huge expenses.

➤ One of the biggest challenges for the HR department to face the issues regarding AI tools as still there is a lack of sufficient technical team in the hospitals thereby they are more dependent on outsourcing.

➢   To perform this type of multivariate longitudinal analysis, which calls for specialised statistical or econometric software like R or Stata, standard HRIS analytics tools lack the flexibility and power (Douthit and Mondore, 2014).

➢   Concerning privacy: Only the authorised individual should have secure access to confidential HR data.

➢   Data availability is constrained due to the movement in human resources towards SAAS (Software as a Service).

The ever-evolving analytic framework focused towards the healthcare sector are now capable to reducing the healthcare costs in one hand and on the other hand it also helps in improving the quality of care by ensuring personalized treatment maintaining chronic disease, databases, improved diagnostics, and disaster planning. The data acquisition in the healthcare sector could be done from the following sources.

Electronic Health Care records
Lab Tests Reports
Diagnosis Center Reports
Health Insurance Claims
Pharmacy
Online Registrations for Health Services by Govt under various schemes
Human Resource in Health-related Sectors
Real Time Location Systems (E.g., Disease like Covid 19, Swine Flu etc.)

Figure1: Sources of Health care data

The above-mentioned elements are the major sources of creation of integrated healthcare services by using artificial intelligence technologies and modern data analytics tools.
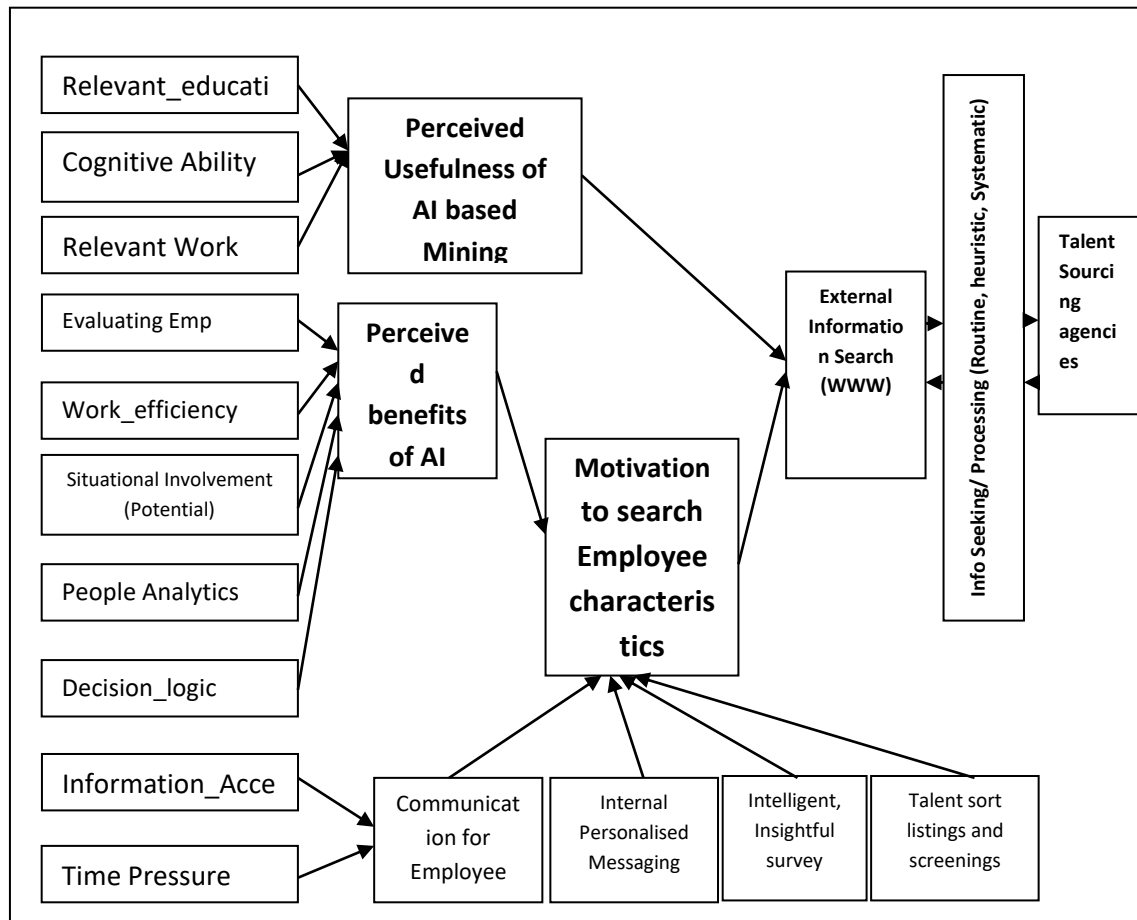
Figure2. Proposed model framework for AI based Human Resource management.

The above proposed model suggests a theoretical framework of optimising HRM resources through AI based approach. However, the situational and cognitive ability are the areas which still needs human intervention to overcome the adoption challenges of AI based approach in the healthcare organisations.

6. Suggestions

With the rapid development of technology, the world is moving very fast, and it is quite possible for the healthcare organizations to make missteps. It is highly recommended to be cautious when deploying AI services for effective human resource management. Proper understanding is required to manage AI systems effectively and efficiently with HRM.

➢ Finding trustworthy and ample learning data sets is crucial. Real-world data should be impartial and inclusive of all conceivable scenarios, both in terms of quality and quantity. Get the appropriate data first, then use AI to produce the best results.
➢ Using the appropriate implementation strategy is equally crucial. The setting for AI is very dissimilar from traditional IT systems. Development is typically concerned with locating data sources, gathering content, purifying it, and curating it. Such a strategy calls for unique abilities, perspectives, and techniques. Finding the appropriate skills and combining them to carry out various HR responsibilities is quite hard and demands core expertise.
➢ With the advent of new technology, it is crucial that the new HR practises are well thought out, safe, and managed. In order for systems to learn, recognise, and correct patterns, they should go through a rigorous training phase.
➢ New HRIS systems are capable of processing information quickly, however they are susceptible to bias in the learning input. If applied correctly, an AI solution can serve as a catalyst for improvement.

> By entering as many potential scenarios as possible and using pre-learning and machine self-learning techniques, a competent HRIS with AI should be able to provide a plan to minimise unforeseen difficulties.

7. Conclusion

HR applications based on Artificial Intelligence have immense potential to increase employee's productivity in the healthcare sector. It would also lead to more knowledgeable HR consultants who would help in boosting healthcare practitioners' performance. Human Resource applications empowered by AI have the superior ability to diagnose, Analyse, predict, and become more powerful and efficient resources. The AI function will affect the employees in multiple ways; therefore, it is necessary to focus on employee needs with regard to providing healthcare services and possible outcomes. For improving the core HR processes, numerous healthcare organizations are experimenting with machine learning and artificial intelligence. These processes include increasing compliance, assessing employee engagement, personalized training, gamifying, automating the on-board processes, analysing candidate suitability, and conducting automated interviews. A number of prominent healthcare companies have already developed state of the art HR tech solutions for offering customized services and tools to meet the demands of the growing marketplace. In the past few years, a number of tools such as chatbots, AI recruitment and intelligent learning platforms have been developed to revitalize the HR functioning and help them deal effectively with the organizational workforce. The future appears promising, and it can be expected that the consolidation and integration of NLP (Natural Language Processing) along with AI-driven technologies will improve data analysis. It would significantly allow the organizations to harness the full potential of the AI based resources.

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