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Artificial Intelligence and HR: Challenges and Best Practices

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Abstract
Artificial intelligence (AI) in the workplace has a lot of prospects thanks to the marriage of robotics innovation, which includes AI and the Internet of Things (IoT). Precision, output, and adaptability are predicted to increase with Industry 5.0. The Human Resource (HR) function is one of the key areas where Industry 5.0 implementation calls for adjustments. Sector 5.0 gives companies a competitive edge by emphasizing HR. To address new challenges and expectations, HR needs to become more perceptive and flexible. We look into how AI may improve and digitize human resources in Industry 5.0. 271 HR experts from the administrative, industrial, and information technology (IT) sectors participated in our study, which examined five AI applications and HR readiness. Utilizing the Analysis of Moment Structures (AMOS) and the Statistical Package for Social Sciences (SPSS), our results highlight how crucial it is to look at hierarchical organizations in order to attain sustainable growth. The five AI applications for HR emphasized the flexibility and potential of people resources while highlighting the significance of safety and wellbeing in AI applications for HR.

Introduction

The main responsibility of the Human Resource (HR) function in Industry 5.0 is to close the technology-human resource gap. The requirement for flexible HR operations to handle people management difficulties is growing as technology progressively affects traditional HR responsibilities [1]. Technology must be integrated to improve the agility of HR procedures in order to achieve this flexibility. Adapting to unforeseen changes requires agility, or the capacity to move swiftly and fluidly. Prominent corporations such as Google, Facebook, Amazon, Microsoft, Apple, and Google have embraced agile HR practises, prioritising the development of people, the execution of critical plans, and the preservation of organisational flexibility. Agile HR works especially well in dynamic roles that are hard to define.[2]

To promote adaptability, HR professionals need to remain aware of how technology is developing and how organizational demands are changing. Prioritizing value delivery and customer satisfaction is crucial for firms striving for agile workforces. Still, HR divisions are frequently criticized for not being more customer-focused and for being slow to respond. HR professionals need to adjust to shifting company needs and technological advancements in order to stay competitive and draw in top personnel.[3] HR practices are being profoundly changed by the rapid breakthroughs in technology, particularly in the field of artificial intelligence (AI). For HR activities to be digitalized, it is essential to comprehend how

AI affects areas like payroll processing, employee happiness, health and safety, productivity, and real-time feedback. [4] With an emphasis on how these interactions effect payroll procedures, employee comfort, productivity, health and safety, and timely feedback, this study investigates the relationship between AI and HR digitization. By the research and design of organizational networks, it seeks to assess the advantages and drawbacks of HR digitalization. The aim of this study is to offer insights on how AI can be used to improve HR policies and procedures, which will ultimately increase overall operational efficiency.[5]

The research questions (RQs) that guide the investigation are:

1. How does AI affect HRM in order to comply with Industry 5.0 requirements?
2. How much of an impact may AI have on Industry 5.0's HRM operations' sustainability?

The following research objectives (ROs) are derived from these questions:

RO1: Examine how artificial intelligence is currently used in HRM.

RO2: Evaluate AI's effect on HRM in order to comply with Industry 5.0 standards.

RO3: Analyze how AI affects Industry 5.0 sustainability.

The paper builds a conceptual framework and does an extensive literature assessment on AI applications in HRM in order to accomplish these goals. The suggested approach identifies important ramifications and offers insightful information to stakeholders who are confronting obstacles in the application of AI.[6,7,8]

Literature review

Roles pertaining to human resources have changed over time to become more dynamic. This study shows the value of the Office of Human Resources and highlights how AI may improve agility in the healthcare industry. The ability of artificial intelligence (AI) to establish Internet-based connections with physical objects, such as electric motors, pacemakers, automobiles, and screens, is one of its primary characteristics. Sensing, processing, and communication are examples of technological features that are directly related to the Internet of Things (IoT). Numerous factors, such as area, speed, temperature, utilization state, malfunction, and stress, are measured by sensors attached to objects.[9] By gathering new data, these sensors are critical to the evaluation of different factors and the transmission of vital information to AI systems, which in turn produce comprehensive, ongoing, detailed, spontaneous, and consistent outcomes. [10]

Artificial Intelligence (AI) has had a major impact on human resource management (HRM) in recent years due to the emergence of Industry 5.0 and its expectations for more automated, digitalized, and flexible HR procedures. AI has the power to completely transform HR procedures by improving efficiency, precision, and judgment, especially when it comes to recruiting and talent acquisition. Artificial intelligence (AI)-powered algorithms can evaluate candidate data to enhance the hiring process by scanning resumes and job applications more quickly and correctly than human screening. [11]

AI has a big impact on employee engagement, retention, and development as well. AI systems can detect possible problems like high turnover or low engagement by examining patterns in personnel data, allowing for preemptive solutions. [12] AI can improve staff growth by pointing up areas of weakness in skills and suggesting specific training courses. Artificial intelligence (AI) systems in performance management can identify areas for improvement and develop individualized growth plans for staff members, increasing output and general performance. Furthermore, by evaluating sensor data to identify possible safety concerns and recommend preventive actions, AI can lower workplace accidents and guarantee regulatory compliance. [13,14,15]

AI integration has the potential to significantly impact performance management, learning and development, hiring, people

management, and workplace safety. But in order to fully utilize AI's advantages without sacrificing moral standards, bias and job displacement issues must be resolved. The effectiveness of AI in HR depends on striking a balance between the benefits of automation and the necessity of human judgment and empathy in HR procedures. [16,17,18]

AI applications in HR cover a wide range of topics, such as quick response times, workplace health and safety, worker comfort, productivity assessment, payroll processing automation, and organizational network and design. AI can improve workplace ergonomics, monitor employee health data, and identify and reduce workplace dangers, all of which help to create a safer and healthier work environment. AI also helps with administrative work automation, real-time productivity feedback, processing payroll, and quick response methods. Furthermore, AI facilitates organizational network analysis (ONA) by automating data collecting and processing, identifying important individuals within an organization, and improving collaboration. Artificial intelligence (AI) may automate the study of work performance, experience, and skill data in organizational design. [19] This helps to identify qualified individuals and encourages more adaptable and inclusive organizational structures.

This chapter provides a thorough knowledge of AI's influence on HR procedures by presenting a conceptual framework intended to assess how different AI applications enhance HR agility. For clarity, a graphic depiction of the suggested structure is provided. [20,21]

Methodology

Using a cross-sectional methodology, the study used a descriptive research design. This method enables for the collecting of data from a big population at a precise point in time, making it ideal for analyzing how AI affects the digitization of human resources in Industry 5.0.[22,23]

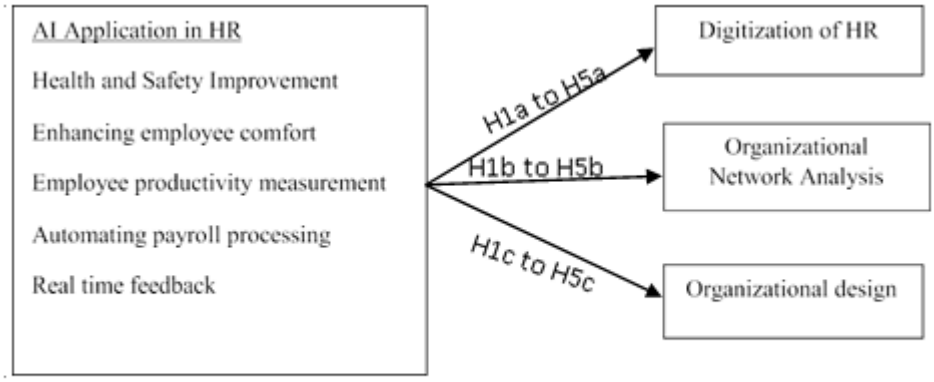

Fig. 1. Conceptual model.

The study's participants were human resource experts from the manufacturing, ITES, IT, and service sectors, based in Delhi and Gurugram. The varied industrial presence of these cities was a deciding factor. Banks in the private sector were part of the service sector. Selecting the location was the first step in the multi-stage sampling process. Next, enterprises within each sector were ranked, and ultimately, respondents were chosen from the selected firms. A total of 330 Google Forms questionnaires were sent out, and 271 of these were thought to be good candidates for study. A minimum sample size of 200 is advised for SEM analysis, while prior research supports a sample size of 271. Furthermore, for structural equation modeling, a sample size of 200–400 is deemed enough. [24, 25]

New scales were created by modifying pertinent literature in order to quantify the constructs in the study model. The scales'

efficacy in measuring the constructs was confirmed by a number of validity and reliability tests. While validity denotes how well a scale captures the intended meaning of a measure, reliability is the consistency of measurement across time. [26,27,28] Strong construct validity and reliability were shown using confirmatory factor analysis (CFA), which was utilized to assess the measures' validity and reliability. Good internal consistency was shown by all constructions' composite reliability (CR) scores, which were above the suggested cutoff of 0.7. Good convergent validity was confirmed by the average variance extracted (AVE) values for every construct being above the 0.5 criterion. Consequently, it was decided that the scales were appropriate for assessing the pertinent constructs. [29]

A structured questionnaire with three sections was used to gather the data. While questions about demographics were asked in the first section, questions about AI applications in HRM to measure human resource agility were asked in the second and third sections, which employed a five-point Likert scale. First, a statistical analysis was conducted using SPSS, and then the proposed model was evaluated using AMOS. The scales were found to pass many validity and reliability tests, which permitted the research to continue. [30,31,32]

After verifying that each variable's skewness and kurtosis values fell within the permitted range of −2 to +2, the researcher concluded that multivariate normalcy had been achieved. They arrived at a final sample size of 271 by using the listwise deletion approach to eliminate cases with missing values and the maximum likelihood estimate based on multivariate normality. This was more than the minimal sample size that was advised for SEM analysis. To guarantee precise model specification, an a priori model that was founded on earlier studies and theoretical underpinnings was employed. To evaluate the goodness-of-fit of the model, confirmatory factor analysis was done. [33,34]

The criteria for evaluating discriminant validity, convergent validity, and reliability are listed in Table 1. dependability was measured using Cronbach Alpha (α), where values greater than 0.7 denoted strong dependability. With a minimum value of 0.5, the Average Variance Extracted (AVE) approach served as the main validation standard. These convergent validity requirements were met by every construct. Making sure that the Maximum Shared Value (MSV) and Average Shared Value (ASV) were lower than the AVE allowed for the assessment of discriminant validity. By meeting these requirements, the notions' discriminant validity was confirmed. [35,36]

With a sample size larger than the minimum suggested value of 0.6, the study's Kaiser-Meyer-Olkin (KMO) statistic of 0.872 indicated that the data were appropriate for factor analysis. The results of Bartlett's test of sphericity showed that the correlation matrix was adequate, and the difference was statistically significant ($P < 0.001$). With a significance level below 0.0001, the test result of 874.98 disproved the hypothesis that the correlation matrix is an identity matrix. [37] Factor analysis would be advantageous for the dataset, as suggested by this significant value (less than 0.05). [38]

Results, analysis, and interpretation

This part offers the conclusions and interpretations together with the demographic characteristics of the respondents. The survey indicates that women dominated the responses, with men providing 48.3% of the data and women providing 51.7%. The respondents were divided into two age groups: 32.8% were between 21 and 30 and 44.6% were between 31 and 40. The age group that received the most replies was 31 to 40. Sixty-five percent of the respondents held a bachelor's degree, and the remaining individuals held master's degrees. Seeking a bachelor's degree, the majority of responders were. In terms of industrial representation, businesses in the IT and ITES sector made up 47%, the manufacturing sector was represented by 29.5%, and the service sector by 23%. [39,40]

The Structural Equation Modeling (SEM) method and the Analysis of Moment Structures (AMOS 20) application were used to test the proposed conceptual model. It was investigated how the HR Agility dimensions (a dependent variable) and

the AI application dimensions (independent variables) related to one another. The use of AI to HR digitalization, organizational network analysis, and organizational design are the other three causal links examined in the study. [41]

The investigation yields the following beta values: 0.194, -0.278, 0.386, 0.660, and 0.180. HR digitalization is greatly influenced by three of the five AI in HR aspects, with beta values of 0.422, 0.261, and 0.238. Only one aspect significantly affects organizational design, and that is the automated payroll system. With beta values of -0.514, 0.339, -0.222, and 0.630, the remaining four dimensions have a considerable influence on organizational design. [42]

P is 0.154, RMR is 0.006, AGFI is 0.868, IFI is 0.997, GFI is 0.993, CFI is 0.997, and RMSEA is 0.043. These are the fit indices for normed chi-square. These data show that the suggested model fits well within the threshold ranges, with the exception of AGFI. The statistics from the suggested model match these numbers quite well. [43]

The three causal links between the AI application domains and the three HR Agility factors are shown along with their respective outcomes. Every one of the three HR Agility dimensions (endogenous variables) and the five AI applications in HR dimensions (exogenous variables) are connected. The five artificial intelligence components in HR account for 77% of the variance in organizational network analysis. Improvements in Health and Safety are found to have the biggest impact, with a coefficient value of 0.660. [44] The organizational network analysis variance is adversely affected by real-time input. The employee productivity evaluation aspect of AI apps accounts for the biggest percentage of the variance in HR digitalization—51 percent—with a coefficient value of 0.422. [48] The other two features are equally significant. Real-time input has a beneficial impact on organizational design variance, accounting for 44% of the variation with a high coefficient of 0.630. Remarkably, with a coefficient value of -0.514, raising employee comfort has a negative impact on organizational design. [45, 46, 47]

Discussion

Because they understand that having a talented workforce increases income and productivity, supervisors pay close attention to the health and welfare of their staff. HR departments have effective means of monitoring employee well-being with current technologies. For instance, wearables are able to monitor critical health parameters, walking distance, and food consumption. HR staff can prevent medical problems by using this data to identify possible health issues and take proactive steps to treat them. HR can use AI to further improve worker well-being by using facility and equipment inspections to guarantee security. For example, AI sensors can keep an eye on the pressure in gas pipelines to stop leaks. Studies show that HR's flexibility in advancing worker health and safety is greatly increased when Organizational Network Analysis (ONA) and careful organizational design are integrated.

Thanks to technological improvements, HR can now detect eye movements to distinguish between disruptions and productive work schedules. Finding distractions that interfere with an employee's ability to concentrate can be aided by this. HR can introduce a life skills training program to assist staff in balancing work and a healthy lifestyle, which can ultimately increase productivity, if, for instance, an employee's output declines because they need to take a quick sleep in the early afternoon. These results concur with those of previous research [74–76].

On formal matters, direct employee feedback is frequently erratic. HR departments are using AI technologies to assess employees' emotions and collect honest employee feedback in order to remedy this. Cameras can take pictures of staff members after meetings, and computer vision can examine these photos to identify emotional states. If an employee seems upset, HR can be notified. According to prior research [3,76], this adaptive strategy guarantees that the HR function stays flexible.

Artificial Intelligence is also essential for spotting trends associated with mental health problems like depression. Employee

photos taken by automated cameras at certain intervals can be analyzed by computer vision software to look for indicators of discomfort or isolation. AI can notify HR if these indicators are seen, and HR can subsequently set up counseling sessions to assist the impacted employee. Nonetheless, compared to other studies, the current analysis indicates that this can have a distinct impact on organizational design [50]. Although AI sensors are capable of detecting absenteeism, research by [49] has shown that they are not appropriate for tracking work hours in all job kinds, especially those involving field work.

Implications

- **Enhanced Decision-Making**: Through data analysis, AI provides HR managers with comprehensive insights that improve decision-making in the areas of hiring, employee engagement, and performance management.
- **Employee Wellbeing**: AI solutions can monitor worker health and safety, allowing HR to identify and handle problems like depression or stress. This makes it easier to put proactive assistance measures like therapy sessions into action.
- **Productivity and Efficiency**: AI frees up HR workers to focus on strategic projects that improve organizational performance by automating repetitive HR operations like payroll processing and attendance tracking.
- **Agility and Adaptability**: AI enables HR departments to quickly adapt to changing business requirements and technology developments, maintaining a staff that is productive and competitive.

Scope of the chapter

- **Interaction of AI and HR Digitization**: The chapter examines how AI is affecting a number of HR tasks, such as processing payroll, employee happiness, productivity, health and safety, and real-time feedback. It highlights the digitization of HR operations and talks about the advantages and restrictions that come with it.
- **Conceptual Framework and Literature Review**: A conceptual framework is developed based on a thorough analysis of pertinent literature on AI applications in HRM. This framework seeks to provide light on how AI affects HR procedures and guidelines, especially in light of Industry 5.0.
- **Research Questions and Objectives**: The study looks at the impact of AI on HRM in compliance with Industry 5.0 requirements and possible ramifications for the long-term viability of HRM operations. The goals are to examine how AI is now being applied in HRM, evaluate how AI is affecting HRM standards for Industry 5.0, and examine how AI is affecting the long-term viability of Industry 5.0 practices.
- **AI Applications in HR**: The talks on how AI is affecting hiring, employee development, engagement, retention, performance management, workplace safety, payroll processing, and organizational design, among other HR-related tasks. It demonstrates how AI may improve decision-making, productivity, and HR agility.
- **Challenges and Best Practices**: The article also discusses the difficulties of integrating AI in HR, including potential job displacement and prejudice in AI systems. It highlights how crucial it is to weigh the advantages of AI automation against moral issues and the necessity of using human judgment and empathy in HR procedures.
- **Future Directions**: Future study directions are suggested by the, which include looking at the quantitative impacts of AI-based HR decisions on employee churn and business success as well as employee perspectives on AI-based HR practices. It emphasizes the significance of continued research and cautious evaluation of AI's consequences as the technology advances.

Limitations of the chapter

The admits a number of drawbacks with the way AI is being used in HR:

1. **Data Privacy and Security**: There are serious security dangers associated with the growing amount of employee data that AI is collecting. Businesses need to put a high priority on data protection and put strong security measures in place.
2. **Bias and Fairness:** AI systems have the potential to reinforce biases found in training data, which could result in unfair treatment of workers. For AI systems to be fair, ongoing oversight and development are required.
3. **Job Displacement**: Concerns regarding job displacement may arise from the automation of HR tasks. Businesses must strike a balance between implementing AI and plans to retrain and reassign impacted staff members.

Strengths of the chapter

- **Comprehensive Literature Review**: A strong conceptual framework is based on the comprehensive literature evaluation provided by the. This guarantees that current research and theory serve as the study's foundation.
- **Clear Research Objectives and Questions**: The provides a clear emphasis and direction for the study by outlining particular research questions and objectives. Understanding the effects of AI on HR procedures and the long-term viability of HR operations in the context of Industry 5.0 is made easier by this clarity.
- **Diverse AI Applications**: The covers a broad spectrum of AI applications in HR, such as payroll processing, employee development, performance management, hiring, and workplace safety. This wide range guarantees a thorough comprehension of AI's possibilities in HR.
- **Quantitative and Qualitative Analysis**: It uses both qualitative and quantitative analysis techniques to provide the data a thorough study. The results' validity is increased by the application of structural equation modeling (SEM) and the Analysis of Moment Structures (AMOS) program.

Conclusion

While incorporating AI into HRM has several advantages for HR departments and staff, there are drawbacks as well, including network security issues and legal issues. Organizations must prioritize employee privacy and implement information-driven security solutions because of the security dangers posed by the growing number of devices and employee data. The significance of taking important human elements into account when investigating AI applications in HRM is emphasized by this study. The digitalization of Organizational Network Analysis (ONA) and HR has a closed-loop technical influence that encourages iterative HR tasks. To advance these characteristics in the Industry 5.0 era and create the foundation for further improvements, a well-thought-out organizational structure is essential.

Both the development of AI-based HR software and its application in HRM are still in their infancy in India. A thorough examination is limited, according to the report, by the implementation of AI in HR practices' early stages. Notwithstanding the enormous recruitment potential of AI, issues including systemic biases and possible job displacement must be addressed. By include a wider range of interviewees and organization-specific analysis, future study should delve deeper into these concerns. Important insights will come from examining the quantitative effects of AI-driven HR choices on employee attrition, corporate performance, and employee perceptions of AI-based HR practices. As AI develops, thorough consideration of its consequences and continuous research are crucial to maximizing its benefits for HRM.

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