Effectiveness and Difficulties of Artificial Intelligence Application in Human Resource Management

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Abstract

Understanding the potential uses of artificial intelligence (AI) in the human resource management (HRM) field is the aim of this research, which draws from a number of previous studies. This paper investigates the application of artificial intelligence in the field of HRM based on the core concepts of HRM theory. The literature review for this study employs the narrative methodology. We have deliberately decided not to use a methodical approach for the review of literature because it requires specific research questions that we believe are outside the scope of this study. The study concludes that, human resource techniques and staff relationship management remain in the phase of experimentation, AI has a significant and positive impact on four aspects of HRM theory: hiring, training and development of staff, managing staff productivity, and staff salary evaluation. Even though AI is widely used, there are still issues with data identification, impartial data creation, and staff happiness that need to be taken into consideration. This demonstrated how various AI applications are used in HR; government agencies, for instance, use the Oracle programme for hiring. Additionally, the study has supported a few noteworthy gaps in the literature that allow for a wide range of additional research. We think filling in the gaps will steer the field in the right direction when it comes to implementing AI in the field of human resources management.

Keywords: Artificial Intelligence, Human Resource Management, Strategic Human Resource Management, Integrated Development Support System

Introduction

Artificial intelligence (AI) is the ability of machines to replicate or surpass human intelligence, including experience-based learning and reasoning. Not just computer programmes, but a wide range of goods and services are currently utilising artificial intelligence (Kumar, 2022). Artificial intelligence and other AI-based technologies are used by many business sectors, most notably the HRM sector. Artificial intelligence (AI) and other AI-based technologies are used by many business sectors, most notably the HRM sector. AI has been introduced into HR by human resource professionals. Artificial intelligence is used to identify, evaluate, and mimic the mental processes of a living being. It uses global data to draw important conclusions about how best to use human assets to achieve organisational desired outcomes. Tariq and Abonamah (2021) have demonstrated the usefulness of AI in a number of HR-related domains, such as decision-making processes, staff mood assessment, and integrating of new hires. For instance, when a new employee joins a company, they often have a lot of unanswered questions. With the aid of artificial intelligence, they can quickly and easily find the answers to all of their questions. Similarly, AI assists customer service representatives in recognising their emotional fluctuations when interacting with clients, allowing them to make necessary adjustments. Additionally, AI can assist staff members in creating their career ladders without the need for human assistance by using previously collected data (Ahmed, 2018).

Attracting and preparing workers for future AI-enabled jobs is one of the primary strategic goals of using AI in HRM. In a number of industries, artificial intelligence is gradually replacing traditional labour (Jaiswal et al., 2022). If the current trends continue, many aspects of conventional employee management will change dramatically. A human resource manager of the future might oversee both artificial intelligence and human labour. These factors will cause a paradigm shift in certain industries. Sakka et al. (2022) state that for a very long time, people thought that while technology was eliminating professions, it also brought about new, better ones. Businesses have found that using mechanical technology, artificial intelligence, and human-made reasoning may replace humans and increase accuracy, profitability, and effectiveness at work indicates that about 50% of the tasks that people do in the workplace today might be automated, usually using already available digital and artificial intelligence (AI) technology (Olan et al., 2022). The ethical analysis addresses the nature of the job and, on a larger scale, the kind of society in which we must all live and

the role that automation will play (Tong et al., 2021). Tiwari et al. (2021) indicated in their research that AI impacts both innovation and ease of use positively.

Samarasinghe and Medis (2020) proposed the "AISHRM" conceptual model, which supports "Artificial Intelligence based Strategic Human Resource Management for industry 4.0" has ushered in a new industrial revolution. Samarasinghe & Medis (2020) also noted that, in an effort to increase productivity and accuracy, machines will take over human labour-intensive jobs. This shift will force organisations to concentrate on strategic HR management because, in industry 4.0, human capital will be valued more as an asset, giving them a competitive edge that can be sustained. AI is also said to be the driving force behind this shift, as machines will replace most labourers. The authors suggested that industry 4.0 human resource issues could be resolved with the aid of artificial intelligence. Additionally, it can assist with issues related to ageing, cost, recruitment and training. Shettigar et al. (2021) discussed how social strategic management would be integrated into their recommended artificial intelligence in six HRM dimensions. Nonetheless, human resource management's theoretical grasp of advanced intellectual capacity (AI) can aid in its adoption. Sakka et al. (2022b) also looked into how AI is used in a variety of fields to improve employee performance, HRM manage human skills, improve employee experience, reduce employee turnover, and develop a solid leadership corps in the working environment. In the service-based economy, where hiring, training, and employee evaluation are critical to a business's profitability and long-term viability, employees are a company's most valuable resource. AI technology can now assist the HR department in processing more information by scanning, reading, and evaluating applications in order to make hiring decisions.

AI is also essential for enhancing retention of talent since it can assess staff efficiency for performance reviews, identify workplace hazards, and do cost-benefit analyses, all of which encourage employees to be more actively involved in their work. The theoretical underpinning of ai implementation in HRM comprises six basic dimensions of HRM theory, as reported by Jia et al. (2018) in a series of studies. These dimensions are: recruiting, training and development, managing employee productivity, measuring salaries, and handling staff interpersonal connections. Additionally, they are all linked and connected by a clear comprehension of ai technology applications in human resources. the application of AI to human resource management was the main topic of this review, which was based on the six fundamental dimensions of HRM philosophy that have been referenced in recent, scholarly works. Since the articles were all published within the last few years, the data can be regarded as current, accurate, and dependable. Based on multiple studies, the goal of this research is to comprehend how AI technology can be used in the HRM industry.

Literature Review
Effectiveness of Artificial Intelligence in Human Resource Management
Strategic planning for human resources constitutes where the management of human resources begins. It helps the business predict employee needs for the near future and with employees attributes all through the plan of action. In the digital age, AI represents a prevalent technological advances that still affects important organisational functions and effectiveness. Businesses can attain high levels of effectiveness and productivity by integrating AI (Olan et al., 2022). Artificial intelligence makes use of a wealth of knowledge to improve allocation of resources and reduce redundancies within a company. According to Olan et al. (2022), organisations can achieve long-term sustainability by putting in place a complementary strategy. The model blends AI with sharing of knowledge; through promoting creativity, employee empowerment, learning, and alignment of underlying tactics or key indicators of performance, knowledge-based activities give businesses an edge in the market and allow them to enhance their operational efficiency. Service to consumers, cash flow, and business planning are the three main areas in which AI-driven technologies guarantee improved performance for organisations. Sullivan & Wamba (2022) assert that AI is still a fundamental component of organisational productivity. Organisations must put tactics in place to ensure their survival in a market with uncertainties. Artificial intelligence was defined by Sullivan & Wamba (2022) as a machine's capacity to effectively carry out tasks associated with humans. According to the scholars, AI makes sure businesses can handle changes in their operational surroundings. AI is associated with improved resilience and organisational performance in a company. Businesses can use artificial intelligence (AI) to forecast, build relationships, analyse data, and improve decision-making in the face of market volatility. Businesses can use AI to process data and reorganise resources to improve profitability (Sullivan and Wamba, 2022). Organisations become more adaptive, which affects the survival of the company and its core functions. AI thus offers vital insights for improving performance.

According to Noe et al. (2006), human relations management will assist the business in managing its workforce and establishing a rotation of sensible utilisation in human resource management. The organisation will be able to upgrade its managers and increase productivity with the use of AI. The question of whether AI technological devices and programmes can help management recognise and tackle intangible staff behaviours like employee involvement as well as how to enhance it was investigated by Sari et al. (2020). It is therefore regarded as one of among the most important variables that has a direct relationship to productivity. The study employed an interviewing technique to ascertain employee engagement at all levels at SML (security market line) both before and after AI technologies were implemented. The results of the study indicate that AI technologies help management in ways that go beyond the expectations they had anticipated. These benefits include not only assessing employees' levels of engagement but also predicting their attitudes and behaviours and resolving conflicts with precise and efficient methods before they cause stress and disengagement. Businesses now have the chance to improve business inquiries that were previously challenging to obtain and to take a proactive strategy to retaining talent through the integration of AI technologies.

Recruitment

Computer-assisted technologies have begun to replace the conventional recruitment process, thanks in part to the use of AI. Hiring HR professionals, discovers and chooses the best candidate from a list of candidates with the aid of AI face recognition usages. Facial recognition technology aids in determining a few of the candidates' most important soft skills. It also aids in determining the extent to which the applicant satisfies the job specifications. Furthermore, because AI applications validate the recruiters' decisions, candidates can avoid recruiters' predisposition as well. Since the AI database needs to be current with a large amount of accurate and reliable data, numerous studies are still being conducted to close the gap between the practise and theory when it comes to examining the facial recognition abilities of various groups of people. For instance, Amazon's facial recognition system had significant gaps that prevented it from being highly effective (Nawaz, 2020).

Kshetri (2021) used a variety of AI applications and scenarios to examine how AI is used in HR management practises in the developing nations for a number of HR functions, including hiring, retention, training as well as growth and development. The author discovered that using AI could help businesses increase the success and effectiveness of HR tasks like recruiting and choosing employees. Furthermore, AI can lessen the likelihood of scepticism and favouritism in the hiring process. AI has a limited impact on HR practises because it is still an relatively recent subject and not available to all organisations. Upadhyay & Khandelwal (2018) attempted to assess the implications of applying AI to the recruitment procedure. Because AI is being incorporated into the selection procedure, the authors have identified a strategic shift. Organisations have seen a notable increase in operational efficiency and choice of talent by integrating artificial intelligence into their recruiting procedures.

Training and Development

In his research study, ALam (2020) used a sample of 100 employees from the Ajman Planning Division and Municipality to respond to questions about how HRM functions will change in the future as AI techniques are incorporated into its operations. The employees responded to a survey regarding a range of HRM tasks, including enhancing efficiency, hiring, instruction, polarisation, and hiring decision-making, as well as how AI may affect these tasks. According to the results of the investigation, artificial intelligence undoubtedly play a role in HRM in the future. HR departments are advised to begin training their employees on the application of AI and to introduce AI-related topics to students' at all academic levels.

Managing Staff Performance

Presently, a lot of businesses are adopting AI into their business activities and adhering to trends. Singh & Shaurya (2021) looked into the impact of artificial intelligence on HR procedures in companies located in the United Arab Emirates. To test their re-research question, the authors employed a combination of survey and interview techniques. Professionals in AI or HR were among those questioned. According to the study's findings, integrating AI technology into HR procedures improved performance evaluation, boosted training and development programmes, and made HR procedures more efficient. As a result, AI and employee readiness will be critical to the seamless integration of human resources functions into the age of digitization.

Salary Evaluation

Businesses can quickly assess employee performance and develop a more equitable and effective reward system with the aid of AI. Strategically focused and adaptable enough to take into account shifts in the organization's strategic goal and the salary modification. According to Jiang et al. (2018), artificial intelligence enables a company to analyse both the external and the internal reward balance of the business, the pay survey and post-evaluation, and create the optimal wage structure to specify the nature and level of the remuneration. Technology for data mining and talent management techniques can be combined to create an intelligent rewards system and artificial neural networks can be used to create an intelligent wage evaluation framework (Jia et al., 2018). Applications of AI can contribute to more properly compensation management. BP neural networks are a type of managed artificial intelligence strategy that draws on data, psychology, neurology, and biological sciences. It can integrate multiple networks of neural nodes, generate a regular computing model, and mimic the neural networks of the human mind. A just reimbursement system for assessment may be created by using BP's neural network system and big data to generate a smart system for supporting decisions (Richard & Lippmann, 1991).

Difficulties of Application of AI on Human Resource Management

After examining the relevant literature, we have discovered that the four main applications of AI in HRM theory are personnel performance management, hiring, staff development and training, and compensation evaluation. AI's use in staff relationship management and HR tactics is still in its infancy and is limited to a small number of tech businesses. The difficulties of application of AI on HR Management include:

Ethical Issues

In their study, Vrontis et al. (2022) attempted to compile the body of knowledge on AI, including the advantages and disadvantages it presents for managing human resources. The authors came to the conclusion that although AI's creative strategy could improve employee and organisational performance in addition to other HR-related activities, it also raises some ethical questions. Tursunbayeva et al. (2022) state that employing AI to analyse and visualise complex data from all employees or from particular teams as well as divisions in order to offer useful information may raise ethical questions as well as independence and privacy hazards. According to Qamar et al. (2021),

using AI for tasks like evaluating complicated information on performance, developing individualised training suggestions, forecasting future results, and gauging satisfaction with work can lead to biases and injustice. For example, based on the experts' knowledge, the expert system may be biassed when selecting candidates for jobs. This could further result in the provision of preferences for specific genders, talents, backgrounds, ethnic groups, etc. Expert judgement is included as a fuzzy logic the execution input, which raises the possibility of bias entering hiring applicant evaluation as well as performance review processes. Furthermore, employees can be trained using fuzzy data, which could continue the process of stereotypes in HR practises. Empirically, bias of this kind has already been discovered in one of the most important tech firms globally (Vrontis et al., 2022).

In 2014, Amazon Inc. put together a team to create a tool that would analyse resumes of job candidates in order to find the most qualified applicants who would fit the job profile. To determine the best candidates, NLP (natural language processing) and artificial intelligence tools was used. When implemented, these application uses cutting-edge AI algorithms to find patterns in resumes sent in for evaluation and extract crucial traits from those of job candidates who were successful. By the end of 2014, a large number of employees within the company were utilising this innovative technological devices, with a small number heavily depending on it due to its efficiency and a time-saving qualities. When it was found that assessments for technical jobs such as software architects and developers are not carried out in a gender-inclusive way, the company was alerted to the problem in 2015. The company subsequently designated one among its engineers to investigate in order to determine the cause. After extensive research, engineer concluded that the data utilised for training in the AI system was biassed because it contained a large number of resumes from male employees, which was consistent with the then-dominant trend of male dominance in the manufacturing and tech sectors. Because of these inadvertent biases in the training data, the algorithms came to associate resumes with the word "womens", for example, "womens chess club captain," with lower value. Nevertheless, it was found that such an artificial intelligence system might theoretically develop a somewhat bias applicant sorting technique in the future. Following these discoveries, Amazon updated its algorithms to be impartial in these circumstances.

Knowledge Management Challenges
A few issues arose when conducting some research. Although there has been significant progress, Tambe et al. (2019) demonstrate that most businesses still struggle to identify data in HR. AI is the use of computers to carry out operations like decision-making that ordinarily require the expertise of humans. Causal deduction is the first idea that can be used to solve issues at different stages of the AI process. Producing the datasets needed for analysis is much more difficult when causality is not understood because algorithms are developed based more on connection than on cause and effect. Causal reasoning greatly helps explain ability challenges and promote fairness. Enhancing AI-management in HR is suitable from both an effective and appropriate standpoint, as issues related to impartiality and effectiveness are rarely compatible. A potential remedy for this was discovered in research conducted by Merlin and Jayam (2018), which discovered that the effect of AI on recruitment choices, efficiency estimation, and the automated execution of manual tasks is putting more strain on HR managers. Using past information as well as predictive modelling, HR can employ AI to get an understanding of best practises, related issues, and useful actions. It is very likely that at some point in the future, HR and machines may cooperate. The programme will evaluate the performance of staff members and rates of turnover, as well as their backgrounds and skill sets, and compile a shortlist of the best applicants. Every staff member's needs can be analysed and forecast with AI. People choices, those in need of a raise, and those dissatisfied with their work-life balance can be ascertained through this process.

Staff Happiness Challenges
According to Vrontis et al. (2022), another understudied area that begs for more research is how staff members respond to the shift in HRM's organisational role triggered by modern technology. It can either help or hinder the use of automated intelligence in HRM to take into account possible cross-national differences and staff behaviour similarities. Furthermore, it's becoming increasingly clear that some human jobs will be replaced by robots. Nonetheless, in addition to the individuals who are laid off, supervisors and managers are anticipated to be significantly impacted by the use of robots. Thus, it is imperative to gain a comprehensive understanding of how staff satisfaction in the workplace will be impacted by the implementation of artificial intelligence It is nevertheless unclear how hundreds of thousands of employees would respond to such a fundamental change in the organisational structure, despite studies showing that HRM managers and supervisors are positive regarding the potential benefits of AI in HRM.

Ahmed's (2021) study identified additional challenges. While integrating AI with the HR industry could help streamline and expedite work processes, total reliance on technology in the HR industry is unfeasible. Prejudice between staff members and managers are one of the main issues facing the HR sector. According to the article, it could be challenging for technology to take into account the broader social, ethnic, and belief systems of its employees; this oversight could accidentally lead to biases. Ahmed (2018) made an effort to clarify how AI technology breakthroughs have affected HR management in their study. Although the writer of the article failed to clarify the method used, it appears to be a review of the literature. The author came to the conclusion that, even though AI greatly benefits HR, precautions need to guarantee that bias is not introduced. Furthermore, the author pointed out that procedure like hiring could suffer from a lack of human interaction. Maintaining personnel data presents another difficulty. Employers must not make any unlawful use of these data.

In conclusion, the study verified that implementing AI in HR departments can expedite and streamline tasks, potentially promoting fairness and producing more precise outcomes. However, it is imperative to take into account the associated obstacles to ensure that the outcomes do not contradict one another. Although many aspects of integrating AI

into HRM practises were covered in the aforementioned articles, relatively few of them went into great detail regarding the ethical implications of AI. Several studies emphasize the significance of conducting routine reliability tests in order to verify the data obtained by AI; however, doing so is not sufficient to implement AI ethically. Before implementing AI, it is crucial to inform users about its ethics and emphasizes how dangerous AI bias is. If AI bias is not used carefully, it could have such severe and destructive detrimental consequences in the field of human resource management.

Method

The narrative method is used in the research's literature review. Using a narrative approach, one can identify and condense previously published material while also discovering unexplored new fields of study (Cronin et al., 2011). Since the systematic approach used for evaluating the literature calls for particular research questions that we feel are outside the purview of this study, we have purposefully chosen not to use it. The narrative method is the most appropriate strategy due to the study's wide scope. Moreover, we feel that a narrative approach will not veer from the industry standard because we do not employ any quantitative indicators, which are necessary for an organised strategy (Rother, 2007; Ferrari, 2015). There is currently no consensus regarding the standard format for a narrative methodology. The most popular format, introduction, methods, results and discussion (IMRAD), is what we have used. Since there is no requirement for any classification in the method, we do not classify the referenced articles in the study. The references section at the conclusion of the text contains citations to all of the papers that were reviewed.

Results and Discussion

We have discussed some of the benefits of AI. The authors have elucidated that leveraging AI within the HR sector is a means of generating a competitive edge. Finding the right candidate for an appropriate position could be made easier with the help of AI. In the article, it is described as a simple procedure. Employers can ensure significant added advantages and maintain a significant amount of money with AI. Artificial intelligence could analyse vast amounts of personnel data in the industry more quickly and easily than humans can. This could be among the most significant accomplishments of AI systems in the industry. In order to help determine which jobs are best suited for particular patterns of behaviour, an AI system can additionally pick up on human behaviour trends. The issue of machine maintenance, which cannot be costly given the AI system's ability to reduce costs is advantageous to modern businesses. In order to keep the system current and address any shortcomings that were recently found, it is important to run routine updates. Ultimately, this article elucidated that this approach will enable the sector to establish a competitive edge, thereby enabling it to contend in the labour market. In their research, Hmoud & Laszlo (2019) attempted to examine the potential impacts of artificial intelligence implementation on the hiring and selection process in human resources. They investigated the role executives played as well as how AI affects recruiters' jobs. The authors came to the conclusion that because AI maximise repetition in tasks like application assessment, it greatly enhance the process of hiring and choosing employees. AI improves recruitment and lessens bias as well. In order to determine the degree to which AI has affected HR functions, Qamar et al. (2021) reviewed about 59 scientific publications in an effort to learn more about the effects of applying AI tools to HR management practises. The authors discovered that AI greatly improved HR operations.

The authors also provided an idea map that helped demonstrate how AI can streamline the decision-making process in the HR industry. Furthermore, Tariq & Abonamah (2021) claimed in their paper that AI supports organisational needs for staff rewards, which have a big impact on employees' physical and emotional engagement and can be measured using an online survey system to determine employees' needs. The efficacy of AI in the recruitment assessment technique for identifying trustworthy candidates using cutting edge technology has been demonstrated. Integrating the discovery of knowledge in databases with integrated development assistance systems to support is a critical decision-making process for human resource management. An organisational strategy encompassing grasping and harmony, change leadership and oversight, abilities and learning, integration and placement must be adhered to by the organisation for an effective adoption of AI. Hmoud (2021) investigated the impact of AI on specific human resources duties, with a focus on the HR domain's perspectives on AI adoption. 186 human resource executives who are members of the Jordanian HRM Federation were interviewed by the author and found that top executives support is necessary for the organisation to successfully implement AI. The interviews also revealed that HR professionals have a favourable opinion of the widespread use of AI.

AI is being used in the energy and healthcare industries in addition to human resources management. Energy is regarded as one of the primary foundations for financial expansion and industrialization in the United Arab Emirates, which primarily depends on natural fossil fuels like oil and gas, according to Almarashda et al.'s study 2021). AI is being used extensively in energy-related endeavours in the United Arab Emirates. This has a big impact on technology and talent management in terms of lower costs, more revenue, less labour demands, and more organised and effective services. However, it is also advised to have a knowledgeable and focused individual to offer assistance if any problems or obstacles arise with the artificial intelligence system. Furthermore, AI has had a significant impact on well-being. The UAE government, like other organisations, has determined that, in order to succeed, it will accelerate the use of artificial intelligence in healthcare. Along with many other benefits, it can increase the effectiveness of surgeries, diagnoses, and patient care by protecting patient data. Prior to implementing AI in executive elements, it is crucial to make sure that medical staff use of this innovation has a positive impact on PU and PEU in the healthcare setting. This is directly related to BIU, which is a critical CSF of an effective AI implementation. In order to ensure the success of the AI system's implementation in 13 Dubai health centres, the UAE government is offering management and operating assistance for

TAM, including training, evaluating the needs of the services needed that help those who participate, as well as study technique (Alhashmi et al., 2019).

Gap in Literature and Suggestions for Future Research Potentials

One of the important technological advancement that still has an impact on organisational success is the use of AI. Today, the majority of businesses use AI in various processes. The use of AI is not a novel concept, but society has only recently come to accept it. However, additional investigation is needed to fully understand what already exists, what is unknown, and where future study should go. Additionally, research on the effects of AI on employees is essential, as it reveals various norms and behaviours that are primarily brought about by the application of AI in HRM. In addition, although it appears that research is still being conducted to determine the benefits of applying AI, we have identified specific research gaps that may lead to further studies in the future, including:

a. What policies need to be improved by HR in order to increase AI awareness?
b. The detrimental effects on particular groups, such as those with particular requirements and how society will respond if AI is discontinued.
c. There has not been much investigation into the potential ethical as well as privacy concerns associated with AI use in HRM.
d. **There are no studies that we could find on the application of AI on organisational training and development of managerial competencies in developing nations. In actuality, executive decisions and organisational design are left up to human judgement especially when it comes to AI.**

Conclusions

Although additional research is necessary, our study's analysis of thirty-two papers revealed that the majority of them highlighted the benefits of AI in the HRM industry and how it would rapidly and significantly improve worker effectiveness and productivity. Further investigation revealed that HR uses various AI applications; government agencies, for instance, use the Oracle programme for hiring. Both the hiring manager and the job candidate benefited from this application. Because of the applications that were used and the organization's easy access to potential employees due to the preservation of data, the recruitment procedures is now simpler. Applicants can now select from candidates with talents and experiences. Additionally, there has been reports published suggesting that AI techniques can assess signals of employee success, allowing the business to keep qualified employees and provide training to those without expertise.

The literature review states that every article found that AI improved the functions of HRM, specifically recruiting, training, development, and selection. In summary, AI has the potential to significantly improve a number of HRM jobs, which would raise organisational performance's efficacy and efficiency. But there are certain issues with AI that HRM may encounter, like its incapacity to comprehend impartiality and causality as well as its incapacity to articulate challenges.

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