

Integrating Artificial Intelligence in Human Resource Functions: Challenges and Opportunities

Nordahlia Umar Baki¹, Roziah Mohd Rasdi¹, Steven Eric Krauss¹, Muhd Khaizer Omar²

¹Department Professional and Continuing Education, Faculty of Educational Studies, Universiti Putra Malaysia, ²Department Science and Technical Education, Faculty of Educational Studies, Universiti Putra Malaysia

Corresponding Author Email: nordahliaumar@gmail.com

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i8/18071> DOI:10.6007/IJARBSS/v13-i8/18071

Published Date: 18 August 2023

Abstract

Artificial intelligence (AI) comes in many forms and has entered the overall system of organisations including in human resource (HR), where AI started to replace some of the human functions. Nonetheless, despite increased academic interest, research on AI-based HR tools is limited and fragmented. This article discusses the challenges and opportunities brought together during AI intervention in innovating HR functions. This study systematically reviews the existing literature, highlighting key areas where AI is being integrated, such as recruitment, employee engagement, training and development, and performance assessment. With the integration of AI, it successfully helps the industry to work in more effective and efficient ways through enhancing employee learning experiences, mitigating human biases, reducing manpower and training cost, and increasing employee engagement and retention. On the other hand, there are also studies that have raised the concern of the challenges during the AI integration, such as high implementation cost of technology tools, uncertainty and employee resistance, lack of human touch and legal and ethical concerns. This paper argues that successful integration of AI in HR functions requires a holistic approach. Collaboration between HR professionals and AI experts is crucial to address technical and ethical challenges. To leverage AI, organisations must embrace change management strategies to facilitate a smooth transition and foster a culture of continuous improvement. This study sheds light on how AI is transforming HR functions and establishes the groundwork for future research such as competency development, workplace learning, and organisation development, enabling practitioners and scholars to navigate the intricate terrain of AI integration in HR successfully.

Keywords: Artificial Intelligence, Human Resource Digitalisation, Career Development, Challenges, Opportunities

Introduction

In the wake of Industrial Revolution 4.0 (IR4.0), advanced technologies such as Artificial Intelligence (AI), Augmented Reality (AR) and Internet of Things (IoT) have gradually become a crucial part of every aspect in human life (Saniuk et al., 2021). As one of the premises of the fourth industrial revolution, AI has grown by leaps and bounds in the past few years. It started to sweep through societies and attracted much public attention that triggered prolonged discussions about its impact on future technological, economic, and social developments (Saniuk et al., 2021). The application of these AI advanced technologies transforms the way of business is conducted locally or globally and it has impacted the way task is designed, employees are engaged, and workplace processes changed (Budhwar et al., 2022; Minbaeva, 2021). With all these changes, there is huge amount of pressure on today's organisations and especially HR functions has a very critical role to play in order to help and navigate through evolutions (Nasir, 2017).

Although AI was defined in 1955, it only came into limelight recently due to the technological revolution across the globe (Tamboli, 2019). Today, AI has evolved rapidly according to the needs of not only individuals but also businesses in various industries such as manufacturing, healthcare, agriculture and many more. According to Dhanpat et al (2020), implementation of AI technology in this era of IR4.0 has majorly transformed manufacturing environments. However, the areas affected by the transformation are not only relevant to the manufacturing sector but also to the way of working especially for HR practitioners (Kazançoğlu & Ozkan-Özen, 2018). The limitless potential of AI has been a driving force for HR practitioners to integrate AI in their system (Yawalkar, 2019). Arslan et al (2021) argued that HR functions that are highly driven by technology have transformed the role of HR from being just a mere support function in organisation to a more strategy-oriented function that helps in driving the whole organisation (IBM, 2020). Although AI is still relatively new technology, but it is already having a major impact on the HR department.

Initially, many organisations were reluctant to spend and invest in AI as compared to other departments such and marketing and finance, but industry 4.0 has brought many changes (Premnath & Arun, 2019). Because everything is moving forward towards digitalisation and automation, and everyone is looking for the best talents to recruit, the only way to compete is through the use of AI algorithm technology in hiring processes (Premnath & Chully, 2019). Besides recruitment, AI has also been used in training and development, and compensation and benefits. Nowadays, everyone is looking for a flexible working environment in this ever-changing world (Mazurchenko & Marsikova, 2019). To cater to the employees' preferences, AI-enriched training systems could offer personalised and customised training that can be accessed anytime and everywhere based on employee's needs (Vaishnavi et al., 2018; Premnath & Chully, 2019; Upadhyay & Khandelwal, 2019). While many discussed the benefits and opportunities of AI to organisations, particularly in the HR department, many also raised concerns about the challenges and harms that could be faced, including employee resistance, ethical issues, cost, and data privacy (Budhwar et al., 2022; Dwivedi et al., 2021; Li, 2022). The objective of this article is to explore the opportunities and challenges of AI adoption in facilitate HR functions. The present study poses the following two research questions

1. How has AI technology shaped and influenced the HR functions?
2. What are the opportunities and challenges of the AI HR digitalisation?

Literature Review

The concept of AI or machine intelligence is based on the idea of how computing systems can replicate human cognitive processes. Alan Turing, the inventor of the computer in the 1850s was the first person to ask, "can machines think?". After a decade, Alan Turing proposed an operational test for machine intelligence known as The Turing Test to measure the ability and capacity of a machine in exhibiting human intelligence (Howard, 2019). This test involved three main elements, namely the human interrogator, computer, and a human foil. Through a display screen and keyboard, the human interrogator will act as a questioner who asks several questions to the respondents (i.e., computer and human foil). If the interrogator repeatedly fails to decide which respondent was human and which was a computer, the computer was considered to have artificial intelligence. Turing (1950) also added that, in order to pass the test, a computer would need four main skills, namely natural language processing skill, knowledge representation skill, automates reasoning skill and machine learning skill. Despite many criticisms received and being a point of argument among researchers and computer scientists, this test however successfully highlighted the concept of AI.

The first definition of AI was given by John McCarthy in 1956 who defined AI as "the science and engineering of making intelligent machines" (Crevier 1993, p. 50). Then, Grewal (2014, p. 13) in his critical conceptual analysis of AI has recommended a more comprehensive definition, "the mechanical simulation system of collecting knowledge and information and processing intelligence of universe: (collating and interpreting) and disseminating it to the eligible in the form of actionable intelligence". The latest definition of AI by European Commission (2020, p.2) is "a collection of technologies that combine data, algorithms and computing power". Based on the different AI definitions, it can be noted that the definition of AI has been modified from time to time according to the need or usage. According to Monett, Lewis and Thosisson (2019), there is no widely accepted definition of AI, hence, instead of spending time in a debating on definitions, many researchers tend to define AI based on their context of study. According to Russell and Norvig (2010), even though AI has been defined in many ways, there are four main approaches that need to be considered in defining AI which are Thinking Humanly (system that thinks like a human), Thinking Rationally (system that thinks rationally), Acting Humanly (system that acts humanly) and Acting Rationally (system that acts rationally).

Overall, there are three basic forms of AI which are Narrow AI (ANI), General AI (AGI) and Super-intelligent AI (ASI) (Bhar et al., 2019). Narrow AI is able to perform single selected tasks in a very efficient way. This kind of AI has intelligence to recognise speech and voice command. Next is General AI, which is more powerful than Narrow AI. General AI represents the general intelligence of humans, so it can imitate humans in many aspects such as learning, planning, reasoning, and judging. Last but not least is the Super-intelligent AI that exceeds human intelligence. Chelliah (2017) has mentioned that this kind of AI are usually wiser and outperforms humans in all aspects like creativity and problem solving. However, it can only be speculated since there is no real-life example of this kind of intelligence yet. Having said this, AI is not stagnant, and it evolves so it impacts significantly on HR specifically and businesses generally.

AI Transforming the Landscape of Human Resources Function

HR in organisations was once doing only administrative works, and its main responsibilities were more to clerical tasks and keeping employee records. However, the nature of HR functions has evolved considerably in the last 30 years. HR functions have changed from mere administrative support into developing the capability of the organisation to survive and grow (IBM, 2020). HR departments also have to face challenges that come from a variety of overwhelming tasks that are extremely time and energy consuming. In the early 1990s, the concept of electronic Human Resource Management (e-HRM) started to emerge due to the application of information technology (IT) that had been widely used by business organisations. Then e-HRM evolved in various ways, such as virtual HRM that mainly uses digitalisation, such as virtual HRM, web-based HRM, business-to-employee (B2E), computer-based HRM systems (CHRIS) and HRIS (Chugh, 2014; Findikli & Rofcanin, 2016). This technology is known as a set of applications that integrate HRM and information technology intended to reduce organisational cost, improve HR services, and improve the strategic orientation (Lepak & Snell, 1998; Bondarouk & Ruel, 2009; Li, 2018). According to Ruel et al., (2007), the adoption of e-HRM during that time was viewed as an organisational effort to maximize HR functions by encouraging HR personnel to spend less time on administration matters.

Now as we step into IR4.0, more advanced technology known as AI has started to be utilised. A bit different from previous technologies that were designed to focus on increasing efficiency while reducing costs, AI technology like machine learning, natural language processing (NLP), augmented reality, cognitive conversation and IoTs to name a few, have been designed to have more added values while completing one task (Guenole & Feinzig, 2018; Bersin, 2018). Performing a strategic HR role in order to provide a competitive advantage to organisations is not an easy task, as the most important resources to drive any strategy is information and data (IBM, 2020). Therefore, it is important for HR to keep up with all the information by implementing AI in its function to achieve the best HR performance and be at par with current HR trends (Tavana & Hajipour, 2019; Kumar, 2019). AI can process vast amounts of data and provide main context to HR personnel. Having said that, all the information required by HR personnel or employees will be there when they need it. Besides that, the ability of AI in reasoning also helps organisations to coordinate a distinctive framework that can reinforce all functions of Human Resource (Merlin & Jaya, 2018; Vaishnavi, Amritaa & Achwani, 2018).

Methodology

As AI technology is an advanced technology in the twenty-first century, hence, available literature is limited. In this search for literature on AI-powered tools used in HR functions, all available research and reviewed articles, conferences papers, and reports published in various online journals such as Ebscohost, Emerald, JSTOR, Taylor and Francis, Sage, Proquest etc. were reviewed using the university's available electronic journal databases. The keywords used for this research included "artificial intelligence", "industry 4.0" "digital transformation", "human resource digitalisation", "challenges" and "opportunities". All the articles collected were published in English language and a majority of the articles were published between 2018 to 2023.

Results and Discussions

Data were gathered from previous literatures and discussed according to the research questions. The present study will discuss according to the transformation of AI in HR functions and the opportunities and challenges of AI in HR digitalisation.

The Transformation of AI in HR Functions

In this section we gathered and discussed how AI tools transform the HR functions including in talent acquisition, training and development, compensation and benefits, performance management, career development and employee engagement.

AI Technology in Talent Acquisition

Every organisation agrees that skilled and talented workforce will contribute to the overall performance of the organisation since employees are the social machinery who drive the organisational function. However, due to the technological disruption, the process of talent acquisition becomes more and more competitive for organisations (Das & Kodwani, 2018). In line with the IR4.0, many top global companies have considered adopting technology in their talent acquisition strategy. Sourcing talent using AI technology enables HR personnel to reach larger talent pool (Geetha & Bhanu, 2018; Johnson, Stone, & Lukaszewski, 2020; Premnath & Chully, 2019). Especially for highly specialised and rare skill set position, AI would help to reach the potential candidates even when they have not applied for that position. Traditionally, HR could only do sourcing through phone calls, emails, and social networking. Now with AI-based search engine, HR can source, and screen potential candidates based on semantic annotation of job posting in under a minute (Strohmeier & Piazza, 2015; Strusani & Hounbonon, 2019).

Other than that, in order to get a perfect candidate, the selection phase during the recruitment process must be done meticulously. However, screening resumes from a large applicant pool within a limited time is a challenging job for HR personnel (Geetha & Bhanu, 2018; Hamilton & Sodeman, 2020; Premnath & Chully, 2019). Preuss (2018) argues that by using AI during the selection process, the recruiter could value the applicant's suitability based on a more holistic view without consuming so much time. Resume-screening machine learning powered by AI will screen applicants' resume by analysing their skills, performance and the possibility of turnover based on available HR data.

This intelligent software also compared candidates and rejected 75% of resumes that are unqualified and finally came out with shortlisted potential candidates (Martin, 2017; McFadden, 2019; He, 2019). In terms of interview session, digital interview has started to be used in many organisations (Sivathanu & Pillai, 2018). AI systems such as Hire IQ and Affectiva are among the intelligent systems that have been used during virtual interview sessions to assess candidate performance. Candidate's face expression, choice of word, tone of voice and speaking pattern are analysed thoroughly to evaluate their emotional intelligence, honesty, and personality traits. From the analysis, all the expressions exhibited by the candidates are converted into numbers and scores (Ovanessoff & Plastino, 2017). Through this analysis, the recruiter evaluates which of the candidates is suitable for the position and organisational culture (Nawaz, 2019; Hmoud & Laszlo, 2019).

AI Technology in Training and Development

Previously, often training and development programs were conducted in the classroom settings either in the hotels or rented seminar rooms. As a standard practice, the trainer will manage the talk and employees will listen and discuss based on the given topic. This has been the practice for more than decades ago. Nevertheless, with the existence of AI and capability of AI in personalised learning, adaptive learning, gamification, microlearning and virtual reality (VR), organisations started to change their learning approach (Bennani et al., 2022). The COVID-19 outbreak had called for physical and social restrictions which led to the acceleration of AI tools adoption in organisations. Although initially organisations refused to fully implement the use of AI in training and development. The call for the implementation of the online learning during the pandemic is the beginning of a change in the learning approach in the organisation (Pramana et al., 2020). AI can also identify what kind of training is needed by organisations based on skill shortage analysis. Not only that, through AI-enriched training systems, AI based training also could offer personalised and customisable training based on employee personal learning history and skills level (Vaishnavi et al., 2018; Premnath & Chully, 2019; Upadhyay & Khandelwal, 2019). AI also provides alternative ways of training such as open learning or self-paced learning. Through this kind of training approach, all the training resources can be accessed anytime and everywhere. Hence, employees can attend the training at their convenient time and place using any devices (Premnath & Chully, 2019).

At the same time, AI also enables coaching or training sessions through Chatbots (Kreutzer et al., 2020; Upadhyay & Khandelwal, 2019). This kind of self-learning program offers more interactive on-the-go training sessions because it can boost employees' interest and confidence, since Chatbots provide quick response and identify a winner for every training session. In terms of practical training, VR technology helps employees to get a better understanding during the training session because participants have the opportunity to have a seemingly real experience through the simulation program (Maity, 2019; Wang et al., 2018). Therefore, training can be delivered in more fun and effective ways. Finally, AI-powered learning will help HR to measure the effectiveness of each training session by tracking employees' ability and skill progression after the training completion. This system will further suggest the next suitable training for employees after they have reached certain levels of skills or performance (Geetha & Banu, 2018; Maity, 2019).

AI Technology in Remuneration

Remuneration, or also known as compensation and benefit, has been one of the main factors in attracting talent as well as increasing existing employee motivation. Many factors need to be considered in compensation planning such as the level of demand for a skill, market rate of payment of a skill and the relationship between the performances and salaries or bonuses of an employee (IBM, 2020; Bora & Borah, 2020). To get all those data, it requires a lot of effort from the HR practitioner to ensure that they have offered benefits according to the market. Now, with the integration of AI-based machine learning, more detail and comprehensive analytical support of current incentive systems can be done for the organisation to plan a wiser budget. In addition, AI systems in compensation and benefit function not only help HR in analysing internal data but also external data like statistics from labour department (Li et al., 2018). AI-powered tools can help HR personnel such as in (refer to Johnson, Stone & Lukaszewski, 2020; Premnath & Chully, 2019; Tambe et al., 2019):

- (i) Salary benchmarking or checking which help analysing remuneration data from various sources to provide accurate benchmarks for specific job roles to attract new talents.
- (ii) Performance-based compensation technology that could help to design and manage performance data to provide appropriate compensation and reward structure to performers.
- (iii) Predictive analytics or also known as forecasting the remuneration trend to identify issues before they become a problem. Indirectly, it can recommend benefit options that are tailored to the needs most likely to be valued by employees.

With the above AI-tools technology, decisions about salary and increment can be more accurate and at par with what the market is paying. AI also creates more agile compensation and benefit programmes where employees can be remunerated by organisations in small fragments rather than doing it once a year (Pandey, 2020; Nawaz & Gomes, 2019). It provides employees with an initiative to always keep their skills competitive in order to receive the remuneration.

AI Technology in Performance Management

The integration of AI in performance management function offers HR personnel a better way on how to operate the process of performance appraisal (Wang et al., 2017; Vaishnavi et al., 2018; Bersin, 2018). Due to hectic day-to-day tasks, a majority of managers has limited time to give immediate feedback to their subordinate. Therefore, they tend to overlook many aspects of subordinate's contributions. This situation will eventually bring negative effects to employees' performances and bring out feelings of being underappreciated, which finally could lead to employees' disengagement and turnover (Buck & Morrow, 2018). With the help of AI-driven performance systems, this issue can be avoided since AI has the ability to consistently monitor employee performance in real time and give feedback promptly (Rajesh et al., 2018; Premnath & Chully, 2019; Saivikumar & Thamodaran, 2020). Employees with great performance will be rewarded and recognised quickly. On the other hand, those employees whom fail to reach their milestone, AI systems would immediately notify and suggest corrective actions for them (Sivathanu & Pillai, 2018). In addition, AI-driven performance systems enforce transparent performance appraisal, where all the information regarding the evaluation can be accessed by not only managers but also employees. Hence, employees get clear information on how to achieve good appraisal. AI systems like data analytic and big data also allow HR personnel and managers to evaluate employees based on scientific basis instead of subjective evaluation. Therefore, there is no room for bias performance appraisal (Merlin & Jayam, 2018).

AI Technology in Career Development

In respect of career development, AI could represent HR personnel or Head of Department in career coaching by acting as a virtual personal mentor who helps employees to continuously grow and enhance their performances (Maity, 2019; Upadhyay & Khandelwal, 2019). AI makes the process of career tracking easier by collecting all the data regarding employee performances and level of skills from superiors, co-workers and the employee himself (Premnath & Chully, 2019; Sivathanu & Pillai, 2018). Through data and information gathered, AI based virtual mentor will periodically track employees' continuous development and come out with comprehensive performance report to map the next suitable opportunity in the

employee's career (Merlin & Jayam, 2018; Vaishnavi et al., 2018; Rathi, 2018; Rajesh et al., 2018).

AI Technology in Engagement

Many companies use AI to engage with their employees. AI conversational platforms like chatbots make communication between HR and employees easier (Bora & Borah, 2020). Employees feel more engaged because their queries or problems can be answered immediately without having to wait. Also, AI-based sentiment analysis helps HR in obtaining a holistic picture of their employees' engagement levels by analysing large volumes of opinions and feedback from employees to reveal how they feel in the workplace, from the matters of work-life balance to compensation and benefits (Strohmeier & Piazza, 2015). Therefore, employee's engagement level can be pre-determined so that organisations could provide early support to help employees overcome any unsatisfactory that could lead to a decrease in employee's engagement (Merlin & Jayam, 2018). Another AI technology called Neuro Cap has been widely used in China to monitor employees' brain activity and emotions (Chan, 2018). By using wireless sensors placed in employees' caps, AI algorithms will examine the employee's emotions, whether they are happy, stressed, sad or under emotion-neutral state. Thus, HR could identify any changes in employee emotion and come up with interventions such as offering time break or changing tasks temporarily.

Opportunities of AI in HR Function

Based on the implementation of AI in HR function, many significant benefits can be recognized.

Increase the time efficiency of HR department by automating tasks

AI definitely increased the efficiency of human resource department as overall (Vaishnavi et al., 2018; Premnath & Chully, 2019; Yawalkar, 2019). According to Niehueser and Boak (2020), there is no way for HR personnel to go through countless of resume within short time. However with AI, not only screening incalculable resume can be done quickly, other steps in recruitment like sourcing and sending out customized emails to potential candidate also can be done in just a minute, so that the time-to-hire can be accelerated (Rajesh et al., 2018; Geetha & Banu, 2018; Vaishnavi et al., 2018; Van Esch et al., 2019). Also, by integrating AI in recruitment process, organisations could increase their probability in hiring better fit candidates because AI will not miss any potential candidate during sourcing and pre-screening phase. In addition, since AI has the power to analyse data, it can conduct several tests like personality and personal value before candidates proceed with the interview. Hence, recruiter will have more time to focus on higher value work such as engaging with candidates (Upadhyay & Khandelwal, 2018). AI based technology in HR department also may provide 24/7 automated self-services HR to employee, where chatbots or HR virtual assistant can respond to all employees' common HR queries like their benefit coverage or annual leave (Strohmeier & Piazza, 2015; Geetha & Banu, 2018; Bersin, 2018). This kind of automation will facilitate and frees up HR personnel's time to work on more critical tasks like decision making and strategizing (Premnath & Chully, 2019). Same goes to the automation in benefit and payroll system, AI not only saves HR personnel time but also provides fair and accurate calculation (Vaishnavi et al., 2018).

Mitigating human biases

It is crucial for organisation to mitigate bias in all aspects of HR function. Especially, in Global South countries many processes in HR like recruitment, training and performance appraisal done based on nepotism or favouritism (e.g., Zinyemba, 2014; Subat et al., 2020). In respect to that, AI-based system will reduce the possibilities of this kind of bias (Nawaz, 2019; Rathi, 2018; Upadhyay & Khandelwal, 2018; Bora & Borah, 2020) by ignoring some irrelevant information (e.g., gender, marital status, weight, and race) or insignificant perception (e.g. university that applicant went to) during screening process. Therefore, all qualified candidates have an equal chance to move on to the next step without been judged by any irrelevant or insignificant matters. Moreover, by mitigating human biases, organisations also have more chances to recruit diverse talent in order to maintain organisational competitive advantages (Chamberlain, 2016). In terms of performance appraisal, even though human touch is crucial, subjective kind of rating by manager or supervisor usually prone to injustice due to the unconscious cognitive biases such as personal or spill over bias. AI based on data-driven technology however will overcome this kind of issues (Vaishnavi et al., 2018; Merlin & Jayam, 2018). Therefore, organisation could reward and retain the real high-performing employees (Rajesh et al., 2018; Premnath & Chully, 2019; Sivathanu & Pillai, 2018). Last but not least, AI also could reduce bias in learning because it selects the real employee who really needs the training based on their personal profile and performances data (Maity, 2019; Bibi, 2019). There is a potential of instinctive bias regarding on the training opportunity, where the managers sometimes have their favourite choice of employee. This situation needs to be avoided because it eventually will give negative impact to training effectiveness and overall performance of organisation.

Reduce HR Manpower and Training Cost

Application of AI significantly reduced HR costs due to the automation of many tasks like talent sourcing, resume screening, and payroll management. Even though automation systems demand high up-front price at early stage, it can be considered as worthwhile as it lessens the risk of errors in routine tasks (Saharan, 2020; Murphy, 2018). Besides, AI decreases HR operational costs in terms of workforce needed. This is because many tasks can be done by AI at once even though the operation happens at different places. In the matter of training, AI can reduce the training cost by deploying alternative ways of training such as open learning or self-paced learning (Findley & Davis, 2013; Premnath & Chully, 2019; Maity, 2019). This kind of learning session could be done any time and anywhere, from any devices. Hence, there are no more issues regarding time and space constraint, as well as training materials and venue cost (e.g., printed notes, workbooks or module).

Enhance Employee Learning Experiences

AI enhanced employees' learning experiences in many aspects. First, AI has the ability to pre-determine suitable training courses based on employee necessities (Premnath & Chully, 2019; Yawalkar, 2019; Maity, 2019). Therefore, participants can partake the most suitable training. Based on the metacognitive theory, it is important for participants to know their area of weaknesses because learners tend to be more focused in learning when they are aware of their weaknesses (Posner, 2017). According to Bakhshi et al (2017), millennials will become the majority in the workforce by 2030, and the traditional kind of learning would no longer be relevant by then. Millennials prefer to have experiential and informal kind of training.

Therefore, training based on AI technology will provide the best way to meet their needs and expectations in training (Maity, 2019; Vaishnavi et al., 2018; Chopra & Bhilare, 2020; Fulton, 2017; Sivathanu & Pillai, 2018). Furthermore, AI based training provides flexible training time to employees. Hence, employees can partake in job trainings at their own pace with certain flexibilities on time, location etc., so employees feel more engaged with their training. This is important because sometimes each employee needs different kinds of training depending on their weaknesses, so by joining AI based training, it not only saves everyone's time but also helps in increasing training effectiveness. With organisations growing, knowledge needs to be brought out on a platform which can be accessed by any employee in the organisation (Premnath & Chully, 2019; Sivathanu & Pillai, 2018). Therefore, AI opens opportunities for employees to find and share their knowledge in an open platform that makes knowledge sharing activities fun and easy (Maity, 2019).

Increase Employee Engagement and Retention

According to Yawalkar (2019), AI is a powerful engagement booster where it can help organisations understand employees' needs and expectations from the organisation. As stated above (i.e., in AI in employee engagement), there are many ways that AI-based system had been used in providing HR a better picture of employees' real condition. Through that, HR could come up with better plans for organisations to proactively retain the employees (Merlin & Jayam, 2018; Miller, 2018). Claus (2019) stated that talent management today is not just about who would get the best talent, but how to engage and retain valuable employees by offering them compelling experiences at work. By integrating AI in the process of managing talent, HR professionals could be more proactive in taking care of employees' needs and issues before they worsen (Premnath & Chully, 2019; Sivathanu & Pillai, 2018; Bhardwaj et al., 2020).

The Challenges of AI in HR Functions

Every story has two sides of the coin, so does AI. Although many HR practitioners and scholars really appreciate the convenience of AI, there has been a lot of discussion about the challenges or issues related to it.

High Implementation Cost

Even though AI may reduce organisational cost in terms of manpower needed, integrating it into HR systems require organisations to prepare for other related costs such as maintenance and installation cost. Moreover, in order for the AI system to always be up to date, organisations have to bear with its upgradation cost. Likewise, with the implementation of AI in daily work activities, organisations have to make sure HR personnel and employees are able to quickly adapt to all the technological changes. Proper training to increase employee's level of AI literacy is important before the implementation of AI in order to ensure all the necessary knowledge and skills for handling AI tools can be acquired adequately (Manyika, 2017; Bibi, 2019; Premnath & Chully, 2019). Consequently, whenever employees encounter any basic problems during the usage of the technology, they can troubleshoot the problems immediately by themselves. In this situation, the organisation has to invest some amount of money for training and education, with the aim to equip them with certain skills before the implementation (Premnath & Chully, 2019). Especially for older generation who the majority is not familiar with technology, organisations have to allocate a large budget for their intensive on-the-job training since they are more likely to lack of capabilities in handling

technology compared to the younger generation. Hence, for these reasons, nowadays only big companies can afford to implement AI technology in their system compared to small or medium scale businesses (Amrita & Achwani, 2018).

Uncertainty and Resistance

Another major challenge of AI implementation in HR is the uncertainty and resistance from employees. According to Vaishnavi, Amritaa and Achwani (2018) in their study among employees in India, 50% of the employees in the age group of 16-25 were not sure that AI can be useful in human resource function. Likewise, for employees in the age group of 26-35 years old, a majority of them (70%) have similar thoughts. Lack of knowledge and understanding regarding AI technology may be one of the important factors that causes humans to have high level of uncertainty towards AI and decide to resist it. General notion such as “AI will replace human in workplace” and “AI lead to the unemployment” has influenced employees to resist this technology. There are people who believe that the increase of intelligent machines will increase the rate of people losing their job. Especially when they found out that AI is able to do better in repetitive tasks compared than humans, employees believe that the employer will have different employment standards and choose the intelligent robot over them. This concept is not really true, because AI is actually more to support HR professionals to do monotonous and administrative work so that they can concentrate more on their strategic role (Dennis, 2018; Bibi, 2019). Next, another uncertainty is due to the transparency and interpretability when using AI system. When using AI systems, the transparency during decision making is sometimes restricted by things like corporate or any technical literacy. Therefore, it is sometimes hard to be understood by employees with less knowledge on how AI algorithm operates or functions (Rathi, 2018).

Lack of Human Touch

There is no doubt that AI has the power to accomplish tedious and complex tasks in more efficient ways (Samarasinghe & Medis, 2020). However, the ways AI accomplish any task is different from humans because it has no compassion and do not possess any emotion or moral values. Hence, many professionals in HR field are still sceptical about the usage of AI in HR function; as they believe this area requires more empathy and intuition compared to others (PWC, 2017). According to Premnath and Chully (2018), AI is still incapable to understand emotional aspects during decision-making process because it doesn't have its own judgment making skills. When making decisions, AI fully depends on coding and historical data, therefore results produced by AI are highly logic driven. Due to that reason, some of the solutions suggested by AI may not suitable or relevant in real situations. Also, even though AI can help humans in designing and creating, it has a limitation to only do what has been commanded to them. It cannot think creatively like humans. This causes AI to be left far behind the human brain in terms of creativity and innovative thinking. The human brain is more intellectual when generating new ideas and their decisions are also guided by the feeling because they can see, hear, think and feel, which machines cannot.

Legal and Ethical Concerns

Last but not least is the challenges of legality and ethicality of AI usage in HR function. Security of data has been one of the significant points of discussion among AI practitioners and AI researchers (Rani, 2018). According to Premnath and Chully (2019), there are many HR

professionals and employees who are still sceptical about AI as they doubt its ability to keep and secure employee personal data. Therefore, it is a big challenge for organisations to convince the employees that their data will not be misused and will be in secure hands. In addition, with the extra ability of AI to track and monitor multiple aspects of employee behaviour, there is a threat to the privacy of employees as an AI system can lead to unauthorised access to one's online activity data (Upadhyay & Khandelwal, 2019). Hence, a clear line of ethical and moral values should be established between HR and employees in order to avoid HR from crossing the line when using AI along the process of managing employee data and behavioural record (Premnath & Chuly, 2019).

Conclusion and Recommendations

AI has the potential to revolutionise the HR functions, but it is important to be aware of the challenges and to take steps to mitigate them. Based on the challenges and opportunities of AI in HR functions, it can be concluded that AI technology has changed the nature of HR department in a good way by offering new ways of getting tasks done through the intelligence databases function. AI has been integrated in HR function to conduct various tasks from the talent acquisition process until employee exit. Even though AI has been said to replace HR job, the statement is not really true since the AI implementation is more to simplify and automate administrative tasks. Therefore, HR personnel would get more opportunities to focus on strategic planning and critical thinking tasks. All of the misconceptions and negative information regarding AI in the workplace must be clarified because AI should not be seen as a disruption. People must understand that AI cannot entirely substitute humans, and therefore, they should not be threatened by its existence. Instead, people should learn to adapt and work together with AI, so that its benefit can be fully utilised. Therefore, more clear-cut knowledge regarding how AI can help humans and organisations in achieving a better performance should be emphasised. Researchers and practitioners should do further research on the behavioural side of the relationship between employees and AI. This is because the employee's readiness, acceptance or even resistance towards AI should be taken into consideration because they are the one who need to work hand in hand with AI. Simultaneously, new job roles that emerge due to AI integration should also be identified so that the right talent with appropriate skill sets can be prepared.

Acknowledgement

Authors acknowledge the Ministry of Higher Education (MOHE) for funding under the Fundamental Research Grant Scheme (FRGS) (FRGS/1/2020/SSIO/UPM/02/4).

References

- Amla, M., & Malhotra, P. M. (2017). Digital Transformation in HR. *International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS)*, 4(3), 536-544
- Bakhshi, H., Downing, J., Osborne, M., & Schneider, P. (2017). *The future of skills: Employment in 2030*. Pearson.
- Bennani, S., Maalel, A. & Ben Ghezala, H. (2022). Adaptive gamification in E-learning: A literature review and future challenges. *Computer Applications in Engineering Education*, 30(2), 628-642
- Bhardwaj, G., Singh, S. V., & Kumar, V. (2020, January). An Empirical Study of Artificial Intelligence and its Impact on Human Resource Functions. In 2020 International

- Conference on Computation, Automation and Knowledge Management (ICCAKM) (pp. 47-51). IEEE.
- Bibi, M. (2019). Execution of Artificial Intelligence Approach in Human Resource Management Functions: Benefits and Challenges in Pakistan. *Sarhad Journal of Management Sciences*, 5(1), 113-124.
- Bondarouk, T. V., & Ruel, H. J. (2009). Electronic Human Resource Management: challenges in the digital era. *The International Journal of Human Resource Management*, 20(3), 505-514.
- Bora, K., & Borah, M. U. (2020). Study on the application of artificial intelligence in human resource management. *Journal of Interdisciplinary Cycle Research*, 12(7), 434-450.
- Buck, B., & Morrow, J. (2018). AI, performance management and engagement: keeping your best their best. *Strategic HR Review*, 17(5), 261-262.
- Budhwar, P., Malik, A., De Silva, M. T., & Thevisuthan, P. (2022). Artificial intelligence—challenges and opportunities for international HRM: a review and research agenda. *The International Journal of Human Resource Management*, 33(6), 1065-1097.
- Chelliah, J. (2017). Will artificial intelligence usurp white collar jobs? *Human Resource Management International Digest*, 25(3), 1-3.
- Chopra, A., & Bhilare, P. (2020). Future of work: An empirical study to understand expectations of the millennials from organisations. *Business Perspectives and Research*, 8(2), 272-288.
- Das, R., & Kodwani, A. D. (2018). Strategic human resource management: a power-based critique. *Benchmarking: An International Journal*, 25(4), 1213-1231.
- Dennis, M. (2018). Artificial intelligence and recruitment, admission, progression, and retention. *Enrolment Management Report*, 22(9), 1-3.
- Dhanpat, N., Buthelezi, Z. P., Joe, M. R., Maphela, T. V., & Shongwe, N. (2020). Industry 4.0: The role of human resource professionals. *SA Journal of Human Resource Management*, 18(1), 1-11.
- Findikli, M. A., & Rofcanin, Y. (2016). The concept of e-HRM, its evolution and effects on organisational outcomes. Technological challenges and management: matching human and business needs (1st edition), CRC Press, Boca Raton, 35-51.
- Garg, V., Srivastav, S., & Gupta, A. (2018). Application of artificial intelligence for sustaining green human resource management. In 2018 International Conference on Automation and Computational Engineering (ICACE) (pp. 113-116). IEEE.
- Geetha, R., & Bhanu, S. R. D. (2018). Recruitment through artificial intelligence: a conceptual study. *International Journal of Mechanical Engineering and Technology*, 9(7), 63-70.
- Grewal, D. S. (2014) A critical conceptual analysis of definitions of artificial intelligence as applicable to computer engineering. *IOSR Journal of Computer Engineering*, 16(2), 09-13.
- Guenole, N., & Feinzig, S. (2018). The Business Case for AI in HR. With Insights and Tips on Getting Started. Armonk: IBM Smarter Workforce Institute, *IBM Corporation*.
- Hamilton, R. H., & Sodeman, W. A. (2020). The questions we ask: Opportunities and challenges for using big data analytics to strategically manage human capital resources. *Business Horizons*, 63(1), 85-95
- Hmoud, B., & Laszlo, V. (2019). Will Artificial intelligence Take Over Human Resources Recruitment and Selection. *Network Intelligence Studies*, 7(13), 21-30.

- Howard, J. (2019). Artificial intelligence: Implications for the future of work. *American journal of industrial medicine*, 62(11), 917-926.
- Iqbal, F. M. (2018). Can Artificial Intelligence Change the Way in Which Companies Recruit, Train, Develop and Manage Human Resources in Workplace? *Asian Journal of Social Sciences and Management Studies*, 5(3), 102-104.
- Johnson, R. D., Stone, D. L., & Lukaszewski, K. M. (2020). The benefits of eHRM and AI for talent acquisition. *Journal of Tourism Futures*, 7(1), 40-52.
- Kazancoglu, Y., & Ozkan-Ozen, Y. D. (2018). Analyzing Workforce 4.0 in the Fourth Industrial Revolution and proposing a road map from operations management perspective with fuzzy DEMATEL. *Journal of enterprise information management*, 31(6), 891-907.
- Kreutzer, R. T., Sirrenberg, M., Kreutzer, R. T., & Sirrenberg, M. (2020). Fields of application of artificial intelligence—Health care, education and human resource management. *Understanding Artificial Intelligence: Fundamentals, Use Cases and Methods for a Corporate AI Journey*, 167-193.
- Lepak, D. P., & Snell, S. A. (1998). Virtual HR: Strategic human resource management in the 21st century. *Human resource management review*, 8(3), 215-234.
- Li, L. (2022). Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond. *Information Systems Frontiers*, 1-16.
- Manyika, A. J. (2017). What's now and next in analytics, AI, and automation. *McKinsey Global Institute*, 1–12.
- McFadden, C. (2019). 7 Ways AI Is Helping Revolutionize the Recruitment Industry. Retrieved from <https://interestingengineering.com/7-amazing-ways-companies-use-ai-to-recruit-employees>.
- Merlin, R.P., & Jaya. R. (2018). Artificial Intelligence in Human Resource Management. *International Journal of Pure and Applied Mathematics*, 119(17), 1891-1895.
- Miller, S. (2018). Get ready for the digital future of total rewards. Society for Human Resource Management. Retrieved from <https://www.shrm.org/resourcesandtools/hr-topics/compensation/pages/get-ready-for-the-digitalfuture-of-total-rewards.aspx>
- Nawaz, N., & Gomes, A. M. (2019). Artificial intelligence chatbots are new recruiters. *IJACSA International Journal of Advanced Computer Science and Applications*, 10(9).
- Niehueser, W., & Boak, G. (2020). Introducing artificial intelligence into a human resources function. *Industrial and commercial training*, 52(2), 121-130.
- Ovanessoff, A., Plastino, E. (2017). How artificial intelligence can drive South America's growth. Accenture, available at: [www.accenture.com/_acnmedia/pdf-48/accenture-ai-south-america.pdf](http://www.accenture.com/_acnmedia/pdf-48/accenture-ai-south-america.pdf?_acnmedia/pdf-48/accenture-ai-south-america.pdf)
- Pillai, R., & Sivathanu, B. (2020). Adoption of artificial intelligence (AI) for talent acquisition in IT/ITeS organisations. *Benchmarking: An International Journal*, 27(9), 2599-2629.
- Premnath, E., & Chully, A. A. (2019). Artificial Intelligence in Human Resource Management: A Qualitative Study in the Indian Context. *Journal of Xi'an University of Architecture & Technology*, 11(12), 1193-1205.
- PWC. (2017). Artificial Intelligence in HR: A No-brainer. Retrieved from <https://www.pwc.at/de/publikationen/verschiedenes/artificial-intelligence-in-hr-a-no-brainer.pdf>

- Rajesh, D. S., Kandaswamy, M. U., & Rakesh, M. A. (2018). The impact of Artificial Intelligence in Talent Acquisition Lifecycle of organisations. *International Journal of Engineering Development and Research*, 6(2), 709-717.
- Rathi, D. R. (2018). Artificial intelligence and the future of hr practices. *International Journal of Applied Research*, 4(6), 113-116.
- Ruel, H. J., Bondarouk, T. V., & Van der Velde, M. (2007). The contribution of e-HRM to HRM effectiveness. *Employee relations*, 29(3), 290-291.
- Russell, S., & Norvig, P. (2010). *Artificial Intelligence: A Mordern Approach*. 3rd edition. Upper Saddle River, New Jersey: Prentice Hall.
- Samarasinghe, K. R., & Medis, A. (2020). Artificial intelligence based strategic human resource management (AISHRM) for industry 4.0. *Global Journal of Management and Business Research*, 20(2), 7-13.
- Strohmeier, S., & Piazza, F. (2015). Artificial intelligence techniques in human resource management—a conceptual exploration. In *Intelligent techniques in engineering management* (pp. 149-172). Springer, Cham.
- Subat, A., Rahman, M. M., & Rahman, M. R. (2020). Employees Perception on Recruitment and Selection Process in Banking Sector of Bangladesh. *The Journal of Management Theory and Practice (JMTP)*, 1(3), 21-27.
- Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and a path forward. *California Management Review*, 61(4), 15-42.
- Tamboli, A. (2019) Artificial Intelligence Beyond 2020. In: Keeping Your AI Under Control. Apress, Berkeley, CA. https://doi.org/10.1007/978-1-4842-5467-7_1
- Upadhyay, A. K., & Khandelwal, K. (2019). Artificial intelligence-based training learning from application. *Development and Learning in Organisations: An International Journal*, 3(2), 20-23.
- Vaishavi, K., Amritaa, K. S. & Achwani, S. (2018). A Study on Use of Artificial Intelligence in Human Resource Management. *Gavesana Journal of Management*, 10(2), 45-56.
- Van Esch, P., Black, J. S., & Ferolie, J. (2019). Marketing AI recruitment: The next phase in job application and selection. *Computers in Human Behavior*, 90, 215-222.
- Wang, A. M., Wang, T. L., and Huang, C. J. (2017), *Big Data on Human Resource Management: Model, Theory and Application*, Tsinghua University Press, Beijing
- Wang, P., Wu, P., Wang, J., Chi, H. L., & Wang, X. (2018). A critical review of the use of virtual reality in construction engineering education and training. *International journal of environmental research and public health*, 15(6), 1204.
- Yawalkar, M. V. V. (2019). a Study of Artificial Intelligence and its role in Human Resource Management. *International Journal of Research and Analytical Reviews (IJRAR)*, 20-24.
- Zinyemba, A. Z. (2014). The challenges of recruitment and selection of employees in Zimbabwean companies. *International Journal of Science and Research*, 3(1), 29-33.