

A CONCEPTUAL ANALYSIS OF THE DIFFICULTIES AND POTENTIAL HRM TECHNIQUES FOR THE INTERACTION OF MANPOWER WITH ARTIFICIAL INTELLIGENCE

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Abstract

This essay intends to particularly address the difficulties that modern organizations' human resource management (HRM) departments and leaders confront as a result of the close interaction between human workers and artificial intelligence (AI)—primarily robots—especially at the team level. On the basis of a conceptual evaluation of the available research, it also offers some prospective solutions that may be helpful to overcome these difficulties.

Design, methodology, and approach — *To give a very comprehensive yet critical overview of the interaction between AI (especially robots) and HRM in modern organizations, the current study engages in conceptual work that integrates several streams of literature.*

Results - *We emphasize that interactions and teamwork between human workers and robots are evident across a variety of organizational tasks and industries, where both are contributing team members. The HRM function in modern organizations is faced with some particularly difficult challenges as a result of the need to address workers' anxiety about working with AI, particularly in relation to potential job loss and the challenging dynamics of establishing trust between human employees and AI-enabled robots as team members. Along with these, HRM staff members need to carefully handle employee performance evaluations in the future as well as human workers' expectations for task completion with their AI-enabled robot co-workers. When placing human workers in teams with robots, the authors discovered that organizational support mechanisms such as a welcoming climate, training opportunities, and assuring a suitable technological*

competence level are crucial. Finally, we discovered that one of HRM's most difficult difficulties is performance evaluation in teams where humans and AI (including robots) coexist. We emphasized the possibility of drawing insights from the computer gaming literature, where performance evaluation models have been developed to analyze human and AI interactions while keeping the context and limitations of both in mind. We discussed the lack of frameworks to guide HRM managers in this concern.

Originality/value - *Our study is one of the few to go beyond a broad or functional analysis of AI in the context of human resource management. It focuses primarily on the teamwork aspect, where human employees and AI-powered robots (robots) collaborate and provide insights and suggestions for such teams' efficient operation.*

Keywords: Human-robot interaction, E-HRM difficulties, HRM methods, and artificial intelligence

1. Introduction

As machines transition from being useful instruments for production or usage to playing a crucial part in various aspects of organizational and economic life, the ramifications of technological advancements and innovations for humans are getting more complex (Brockmann P, Schuhbauer H, Hinze A (2019). Work in modern culture is characterized by constant connectedness, immediacy, and a wide range of issues in the work-life balance because to more pervasive digitalization and communication technology (Derks et al., 2015). As a result, work-life balance and how work is defined are changing fundamentally as a result of the increased use of developing technologies related to the newly emerging digital economy, including big data, machine learning, and artificial intelligence (AI) (Petriglieri et al., 2019; Sutherland et al., 2020).

Many examples of how managers and employees behave in a complex environment characterized by quick digital interactions, quick cycle times, technological intensity (Serban et al., 2015), and the gig economy are provided by recent study (Golembiewski, 2019). (Petriglieri et al., 2019; Sutherland et al., 2020). The environment in which managers and employees function is changing due to a perfect storm of technological progress. The discourse is overwhelming in the popular news regarding the benefits as well as challenges (dark side) of adopting current technologies in the workplace (Acedo FJ, Barroso C, Casanueva C, Galán JL 2006). In this regard, a recent Forbes article

emphasized that the future of HR is both digital and human (Forbes, 2019), thus suggesting a significant role of new technology in HRM function. In this regard, recently various concerns have been expressed by the scholars about the potential dark-sides of developing technologies as AI-based analytics within the HRM functions (cf. Davison et al., 2011; Gibbs et al., 2015; Holland and Bardoel, 2016; van den Heuvel and Bondarouk, 2017) (cf. Davison et al., 2011; Gibbs et al., 2015; Holland and Bardoel, 2016; van den Heuvel and Bondarouk, 2017) Multidimensional technological forces involving augmented reality, machine learning, Industry 4.0, the Internet of things, big data, AI and blockchain are radically reshaping work and organisations (Mohanta et al., 2020; Peysakhovich and Naecker, 2017). (; Mohanta et al., 2020; Peysakhovich and Naecker, 2017). Digital technology have become a new strategic necessity for firms (Fitzgerald et al., 2014). (Fitzgerald et al., 2014). As such, managers and employees increasingly behave in unconventional ways and are compelled to use social media, algorithms, big data analytics, machine learning, simulations, augmented reality and games in their everyday lives and as part of their decision-making processes (Serban et al., 2015; Spencer et al., 2012). (Serban et al., 2015; Spencer et al., 2012). While new digital technologies drastically disrupt leaders' work environment, scholarly attention has largely centered on the consequences of certain technologies on companies and their leaders (Henfridsson et al., 2014; Spencer et al., 2012). (Henfridsson et al., 2014; Spencer et al., 2012). Constant technological progress, especially in the digital age (Henfridsson et al., 2014), constantly feeds the gap between human workers' existing and desired levels of knowledge and competencies. Information overload can worsen managers and employees' anxiety and personal paradoxes (e.g. Bawden and Robinson, 2009). (e.g. Bawden and Robinson, 2009). Yet, not keeping up with therequired knowledge and competence levels may lead to an insurmountable gap between the actual and necessary human competitiveness levels. Furthermore, the constant flux of new technologies and paradigms makes most existing skills obsolete and diminishes the motivation for building new competencies that may become useless essentially overnight; Henfridsson et al., 2014).Henfridsson et al., 2014). As such, responding to technological change in the current day is a formidable challenge.

In human resource management (HRM), like other management domains, emerging technologies, particularly AI, have become a visible participant expanding beyond their position as only a tool (Brynjolfsson E, Mitchell T (2017)). (Ivanov and Webster, 2019;

Malik et al., 2020; Vrontis et al., 2021). AI consists of a comprehensive collection of technologies that allow the computer to execute many tasks that ordinarily need human cognition, including adaptive decision-making (e.g. Tambe et al., 2019; Vrontis et al., 2021). (e.g. Tambe et al., 2019; Vrontis et al., 2021). It is in such a context that previous research has shown how AI influences specific HR tasks, for instance, how to use data mining techniques in employee selection, intelligent agent technologies for employee development, new employee recruiting through social networking sites by using data extraction tools, smart sensory mechanisms to evaluate employee productivity and detect knowledge hiding (Strohmeier and Piazza, 2015; Richards et al., 2019; Malik et al., 2020). (Strohmeier and Piazza, 2015; Richards et al., 2019; Malik et al., 2020). Yet, so far, the focus of extant research on AI's relevance for HRM has been on its use at a functional level. An interesting dimension of AI in recent years has manifested itself in the visibility of AI-powered machines including robots interacting and collaborating with human workers in a range of tasks from industrial production (e.g. Libert et.al., 2020) to product development (e.g. Demir et al., 2020), and customer service delivery (Ivanov and Webster, 2019). (Ivanov and Webster, 2019).

We specifically focus on the issues that HRM function in current businesses confront owing to close interaction between AI (robots as well as processes) and human workers, especially at the team level, and identify crucial potential techniques, which can be effective to overcome these challenges. By doing so, we contribute to the existent HRM as well as IT management literature in three essential areas. First, we highlight the significant problems and opportunities deriving from adopting developing technology in the workplace. These difficulties and opportunities could seem daunting at face value. Yet, we propose that a greater engagement between social and technology sciences can enable relieving the obstacles and better utilising the potential prospects of the rise of new technologies in the workplace. Second, we highlight the crucial psychological components particularly trust by expanding on recent studies (e.g. Glikson and Woolley, 2020; Webster and Ivanov, 2020; Gillath et al., 2021) as important enablers in facilitating AI-human worker engagement in businesses. Advances in HRM that benefit all stakeholders, including employees and shareholders, can only be made through creating and sustaining trust in AI and other emerging technologies. Last but not least, we highlight the critical

role that HR best practices and training play in improving the integration of emerging technologies into organizations while protecting the security and privacy of employee data. We propose that rigorous HR procedures and training can both enhance workers' confidence in developing technologies and their efficient use at work.

The remainder of the essay is structured as follows. The examination of how AI has affected HR roles in modern organizations is presented in the section that follows. The difficulties presented by the rise of AI for HR strategy and operations are then discussed. The paper then presents theoretical, managerial, and policy implications as well as potential future research areas.

AI and HRM: A Summary

There are several ways to characterize artificial intelligence (AI), a significant and fundamentally transformational new technology. Nevertheless, in general, it relates to a machine-based system's capacity to accurately understand external data, learn from it, and modify that knowledge to pursue certain objectives and complete tasks (e.g. Kaplan and Haenlein, 2019). First-generation AI, which focuses on doing specific tasks alone, is now widespread across a variety of organizations. It is increasingly being suggested that artificial general intelligence, which is projected to be able to think, plan, and solve problems independently for tasks it was never even intended for, will develop from first-generation AI in the near future (e.g. Kaplan and Haenlein, 2019). Artificial general intelligence is expected to make some white-collar duties more difficult, but it's unlikely to represent a serious danger to the uniquely human features of modern management, like interpersonal connections with staff members and emotional intelligence among managers and employees. However, in the long run, artificial general intelligence might be succeeded by artificial superintelligence, in which self-aware and conscious machine-based systems are anticipated to exhibit scientific creativity, social skills, and general wisdom, which have previously been associated with humans. These advancements have the potential to make humans obsolete. When artificial superintelligence reaches a certain point, it is likely that humans and human labour will be fundamentally questioned, either transformed or rendered obsolete. This will have major effects on employee productivity and retention. The emergence of recent AI-based technologies, such as conversational systems, immersive technologies, and autoregressive language models like Generative Pre-

trained Transformer-3 (GPT) hint at specific challenges that humanity and workers will face if/when artificial superintelligence becomes a common phenomenon.

The field of human resource management can use AI in a variety of ways. For instance, AI techniques have been used to streamline hiring procedures and practices for selecting candidates (Rodney et al., 2019). Similarly, AI-based decision-making tools in the workplace have emerged in the form of big data algorithmic analytics, sensory and tracking devices, and metabolism monitors (Nica et al., 2019). Smart HR 4.0, which was inspired by Industry 4.0, has also been used to transform the processes for onboarding, developing, and offboarding employees in the HRM industry (Sivathanu and Pillai, 2018). These expanding HRM applications of AI can be viewed as both career opportunities and a difficult behavioral challenge, particularly for individuals who are directly affected by the threats AI poses to their jobs (Abdeldayem MM, Aldulaimi SH 2020).

Employees must contend with toxic decision-making processes and threats from rival businesses as a result of the issues posed by AI-related applications in HRM (Maitlis and Ozcelik, 2004). Current research on digital businesses shows that sneaky HRM strategies that are detrimental to workers' interests are becoming more prevalent (Mosco, 2016). As a result of the growing wave of layoffs and redundancies caused by AI and related technologies, affected professionals and co-workers (survivors), who stay in organizations but are typically in a more precarious situation as a result of the wave of technology-driven layoffs and redundancies, suffer severe emotional damages (Moore, 2018). The conventional psychological and social contract, which provided job stability in exchange for organizational loyalty, has changed as a result of the downsizing and restructuring that have occurred in many organizations as a result of these advances (Petriglieri et al., 2019). In this line, even if human labour continues, certain significant changes are foreseen, such as general rationalization, maximizing the product extracted from labour inputs, and AI-driven replacement of humans in crucial activities requiring substantial mental powers (Pueyo, 2018). Additionally, research reveals that HR managers are underprepared because most of them lack essential knowledge and training in contemporary technology-enabled technologies, which may have an impact on employees and organizations (e.g. Holland and Bardoel, 2016; Mariappanadar and Aust, 2017). Also, there are problems with how staff members and their bosses use IT tools improperly and disclose information to unintended

parties. Similar to this, organizations have enormous challenges in protecting and securing the personal data of their employees, as misuse of this data and publication of it online could have a negative impact on employees' welfare.

Additionally, despite constant technological change that is accelerated by illnesses like anxiety, stress, and burnout, workers must deal with psychological and existential difficulties associated to managing "impossible expectations" (Brockmann P, Schuhbauer H, Hinze A (2019).

In particular, managers and employees may struggle with feeling confident using AI-based tools and algorithms, face constant pressure to change and adapt in the face of AI-driven work paradigms and systems, worry about controlling AI-based machines to prevent autonomous decisions and implicit biases, and possibly feel overburdened by new work requirements (Kaplan and Haenlein, 2019). Both HRM managers and employees will certainly have a lot of concerns and issues as a result of machine-human interaction in the workplace. Such interactions and the growing use of AI systems are also probably going to influence how people work and how performance is evaluated and managed (Richards et al., 2019). As a result, AI systems and AI-based tools are deeply entwined with HRM and are likely to alter the field of modern HRM by posing hitherto unheard-of issues. The HRM function in organizations is also anticipated to face substantial issues as a result of this blending and interacting between AI and humans (e.g. Tambe et al., 2019). The discussion of these issues from a critical angle and some suggestions for possible HRM tactics are provided in the next section.

3. Interaction between AI and human workers: obstacles and potential HRM methods

For example, Coupe, 2019; Ivanov and Webster, 2019; Arslan et al., 2021; Hmoud and Lszlo, 2019; requirement for new skills development (Malik et al., 2020; Arslan et al., 2021) and talent management dynamics are just a few examples of the problems AI poses for HRM (e.g. Vrontis et al., 2021). The majority of CEOs, in contrast to the majority of HR managers, believe that AI will generate more jobs than it will kill, according to a recent report by KPMG (<https://home.kpmg/XX/en/home.html>) (KPMG, 2019, p. 1). The HR function in the organization has historically viewed technologies, including AI, from a functional perspective, and the focus has been on retraining and skills development for the workers whose jobs may be replaced by AI. This has played a major role in the difference in perceptions regarding the role of AI. Nonetheless, ongoing interaction between AI-

powered robots and human employees in normal organizational duties is a dynamic that hasn't been precisely examined in-depth by researchers or better understood by modern HR managers (e.g. Libert et al., 2020).

It has been argued that Industry 4.0-related technologies have increased the visibility of human-AI interaction and collaboration (typically manifested in the form of robots, though increasingly other intelligent machines are becoming visible to increase productivity), which presents its own special challenges in terms of control, analysis, and performance evaluation (e.g. Tsarouchi et al., 2017; Libert et al., 2020). These academic findings and reports from the general public suggest that digital technologies, like as AI, will have a huge impact on HR, and HR professionals must find strategies to maximize how humans and digital technologies interact (cf. Forbes, 2019). An intriguing illustration of this issue is the so-called "smart (or social) robots," which have been assisting in improving the industrial process by collaborating with humans in industrial assembly lines and providing assistance to human workers by using AI-based algorithms in other organizational tasks (Evjemo et al., 2020). (Ivanov and Webster, 2019). As a result, the AI-powered robots' function as "tools to colleagues" for human workers has altered (Ivanov and Webster, 2019; Seeber et al., 2020). Humans and robots are already playing increasingly sophisticated and collaborative roles in both the production and service sectors as a result of this transition (Seeber et al., 2020). In particular, it has been discovered that this contact and collaboration may be seen in fields including the military, building, agriculture, medicine/healthcare, analytical services, and manufacturing (Webster and Ivanov, 2020). In light of this, it has been proposed that AI will alter the HR function and be essential for filling the skills gaps that organizations are currently experiencing (Blondel VD, Guillaume JL, Lambiotte R, Lefebvre E 2008). In their examination of robot-human co-working in 1,500 organizations, Wilson and Daugherty (2018) discovered that if the co-working is strategically deployed in the pertinent teams, it can complement each other's strengths and raise organizational productivity. In this regard, they emphasize the value of the development of collaborative intelligence and highlight the cobot arm as an example of a cobot arm being utilized in Mercedes-Benz production to improve the human worker (Wilson and Daugherty, 2018). The establishment of such collaboration is not an easy process, though, as several researchers have noted that in addition to having

functional exchanges, such endeavors also have a substantial impact on the significance and meaning of work for human workers (e.g. Smids et al., 2020).

Given that cognitive biases, emotions, and personality variations have a key impact in the success or failure of such collaborations, improving interaction and collaboration between human employees has been an important research area for HRM studies (Mattesich and Monsey, 1992; Driskell et al., 2018; Smids et al., 2020). These factors become even more complicated in environments and contexts where humans and AI-powered robots collaborate as teammates because it's possible that some human workers may be resistant due to concerns about ultimately losing their jobs to technology (e.g. Ivanov and Webster, 2019; KPMG, 2019; Smids et al., 2020) as well as psychological issues with the adoption of emerging technologies. Similar topics have been studied in the past under the general heading of "computer or technology anxiety," which is defined as the degree to which a person feels uncomfortable when utilizing a certain technology (e.g. Mikkelsen et al., 2002). An emotional state like dissatisfaction, uncertainty, fear, or uneasiness can be a sign of this anxiety (e.g. Okumus et al., 2017). Compared to comparatively antiquated technologies like personal computers or traditional organizational IT systems, the circumstances surrounding AI-powered equipment and processes, including robots interacting and cooperating with human workers, are exceedingly complicated. So, it makes sense to assume that certain human employees may experience greater anxiety while routinely interacting with these robots as members of their team. This may have an impact on whether they embrace robots as teammates and assimilate this new reality in the workplace. This worry is a huge challenge for the HR function in modern organizations, one that decision-makers and HR leaders must thoughtfully and effectively address. Earlier researchers have discussed computer- or technology-related anxiety from a state viewpoint (Harrington et al., 1990), which suggests that it can be a passing phase and that anxiety is typically higher when the technology is introduced (Webster and Martocchio, 1992; Novak and Wisdom, 2018). In order to combat this anxiety, previous studies have emphasized the value of clear communication regarding expectations (e.g., Okumus et al., 2017), potential changes in job tasks (Lariviere et al., 2017), training opportunities (e.g., Okumus et al., 2017; Sampson et al., 2020), and adjustment time periods (Arthanat et al., 2019). We contend that the constraints and

reluctances can be addressed by HR departments in organizations where people and AI-powered technologies and processes are interacting or will interact often.

It is also crucial to understand that working with developing technology like AI has a number of challenges, with trust being one of them (Ivanov and Webster, 2019; Webster and Ivanov, 2020; Gillath et al., 2021). Researchers have emphasized the importance of factors like dependability, availability, secrecy, and integrity as the basis for human development of technology trust (Castelfranchi and Falcone, 2010). This trust ultimately has a big impact on relevant people accepting technology (e.g. employees in organisations). Similar to how trust-related concerns have been well-documented in the literature on the adoption of Internet banking, where it is suggested that trust plays a crucial role in the adoption of Internet banking, see Yousafzai et al., 2009 for more information. Hence, it has been discovered that trust is a key element in situations where people engage and work together with robots that are driven by AI (Schaefer, 2013). This relationship between people and machines does present certain difficulties, though. Researchers have emphasized issues like human workers expecting AI-powered devices like robots to perform every task flawlessly, which reduces communication (Schaefer, 2013), or starting to intervene in their activities earlier than necessary out of concern that they won't complete them effectively (e.g. Demir et al., 2020). Also, previous research has demonstrated that whether AI takes the shape of a physical robot or just a virtual program or process, it has an impact on human workers' behavior and faith in it (e.g. Glickson and Woolley, 2020). Additionally, some recent research (such as Gillath et al., 2021) have discussed the significance of attachment in the context of building trust between AI and human labor. Due to the dearth of prior practice-based information on effective techniques in such settings and the topic's novelty, all these aspects of expectations and trust development might be difficult for HRM in organizations. For this reason, it's crucial to include knowledge from adjacent sectors while developing and enhancing HRM practices.

For instance, past researches have discovered that organizational support is crucial for assisting staff in coping with the difficulties associated with new technology and overcoming resistance to its adoption (Mitchell et al., 2012; Sampson et al., 2020). This organizational support typically takes the form of creating enabling conditions and

providing necessary training (Mitchell et al., 2012; Paruzel et al., 2020). Before introducing employees to work in teams that include humans and robots, HR departments must make sure that they have a practical degree of technology-specific expertise. Recent studies, however, have indicated that many businesses are failing to sufficiently train their staff members for interaction and collaboration with AI, leaving them unprepared for the workplace of the future, when this is anticipated to be a familiar sight (Block JH, Fisch C (2020).

The enabling circumstances and training indicated earlier may lead to the establishment of a certain level of attachment (bond) between human workers and AI, particularly if the need for attachment or dependency drive is mentioned by an AI robot as it boosts human workers' confidence (e.g. Gillath et al., 2021). Last but not least, performance evaluation dynamics present one of the most difficult difficulties for the HR function in organizations, particularly when humans and AI-enabled robots are working together as a team. Because this phenomenon is still relatively new, there aren't many HRM studies that specifically address it. Yet, we contend that research in domains like computer gaming, where performance evaluation between human and AI gamers has been addressed from a variety of angles, can help HRM as a study field as well as HR activities in organizations (e.g. Kim et al., 2018). Several researches have highlighted the importance of contextualizing performance evaluation (Backlund et al., 2018), adapting performance criteria to account for human limits (Canaan et al., 2019), and particularly the aspect of weariness (Shen et al., 2019). Such and other related insights will be needed by HRM functions in organizations where human employees interact, collaborate, and maybe compete with AI-enabled robots in the same teams. These insights will be used to construct a reasonably fair performance rating system. To keep human workers motivated to continue interacting and cooperating with AI-enabled robots as team members, this is expected to overcome hesitations and cultivate trust in such developing technology (Bitkina et al., 2020).

4. Recommendations, Ramifications, and Directions for Future Research

4.1 Conclusions

The main goal of this study was to examine the relationship between AI and human workers more closely and critically from the perspective of HRM, with a particular

attention to the difficulties that businesses and employees face as a result of this comparatively recent phenomena. The use of artificial intelligence (AI) in organizations has the potential to improve productivity and streamline organizational procedures and duties, according to existing research and popular media (KPMG, 2019; Forbes, 2019). The worry of people losing their employment and needing further training to use such technology, however, creates substantial psychological hurdles in the adoption of modern technologies.

This research emphasizes that interaction and collaboration between human workers and robots are evident in a variety of organizational activities when both are working as team members, based on a conceptual overview. The HRM function in modern organizations is faced with some particularly difficult challenges as a result, including the need to address employees' anxiety about working with AI, particularly as it relates to potential job loss and the complex dynamics involved in establishing trust between human employees and AI-enabled robots as team members. Along with this, HRM staff members must carefully monitor and communicate human workers' task fulfillment expectations with their AI-enabled robot coworkers in order to preserve the collaborative atmosphere. We emphasize that in order for organizations to profit from developing technologies, organizational support mechanisms such as supportive environments, training opportunities, and assuring a viable technological competence level must be in place before placing human workers in teams with robots (Anderson N 2003). Finally, we discovered that one of HRM's most difficult difficulties is performance evaluation in teams where people and robots coexist. We emphasized the potential for drawing lessons from the computer gaming literature, where performance evaluation models have been built to analyze humans' performance in the same setting as AI, and we highlighted to the lack of existing frameworks to lead HRM function in this issue.

4.2 Management and Theoretical Ramifications

The current conceptual piece's discussion offers managerial and theoretical consequences. The significance of building particular theoretical paradigms that go beyond seeing AI from a functional usage standpoint in HRM and provide detailed insights on the issues arising from humans and AI working together in teams is the first important theoretical implication (cf. Tambe et al., 2019). As challenges and associated dynamics

differ when human workers collaborate with robots in assembly line manufacturing, when they do so on a research and development project in the IT sector, or when they do so in customer service delivery settings, such paradigms will need to be contextualized and industry (sector) focused. Any theoretical work on AI and human worker interaction with an HRM focus should also incorporate multidisciplinary because fields like computer gaming and robotics research have a significant potential to provide insights because of their connection to this context and because there is a lot of technical research being done in those fields already. In addition, essential insights from the technological acceptance model (Davis, 1989; Davis et al., 1989) and the spread of innovations (Rogers, 1995), among others, can help us comprehend the difficulties in implementing and embracing contemporary technologies in organizations.

An important managerial takeaway from the current paper is the necessity of communication and trust-building to overcome the difficulties posed by interactions between human workers and AI. According to a recent research by Demir et al. (2020), AI-enabled technologies, including robots, still require programming in order to comprehend their team environment and interact with human co-workers efficiently. Thus, it is still up to managers and human employees to foster open communication and a sense of trust within these teams. As a result, the managers should provide a reasonably clear description of the performance evaluation criteria coupled with a clear statement of the objectives and expected results of such teams. These efforts are anticipated to lead to the growth of team trust. Teams composed of human and AI workers are increasingly becoming a visible part of the contemporary organizational landscape, and the dynamics of the supporting environment outlined earlier should be clearly seen in HRM strategies of the organization. In these organizations, skills identification and development tactics will also need to be improved, as managers in a hybrid workplace of human and AI workers must have a clear understanding of what specific talents are required in both types for the teams to succeed. The paper has significant policy implications in addition to managerial ones. Given that politicians are promoting the development of infrastructure related to AI and emerging technologies, China and a number of other established economies are prime examples of this. They are making significant investments in AI infrastructure. Given that emerging and developing economies lack such capabilities and that the majority of established markets still possess these skills, authorities must invest in crucial skills. Less individuals may

commute to work as a result of organizations from various industries embracing and utilizing developing technology like AI and robots (Angrave D, Charlwood A, Kirkpatrick I, Lawrence M, Stuart M 2016). As the current epidemic has demonstrated, businesses are using developing technologies to carry out a variety of tasks and enable work from home. In light of this, policymakers must collaborate closely with businesses in order to encourage the creation of good HRM procedures that facilitate the use and implementation of new technology.

4.3 Directions for Future Research

Also, our paper provides crucial directions for further study. Future research might first gather longitudinal data to evaluate how skilled and semi-skilled workers respond to new technologies like AI and track productivity gains as a result. Second, the use and implementation of emerging technologies can benefit from the involvement of key decision-makers and boards. Future research must therefore look at the kinds of leadership philosophies that support the use of new technology in the workplace. Third, by analysing human employees' emotions and adjustment dynamics in teams where they are working with AI-powered robots, future research can experimentally investigate the touch problems of developing technologies like AI in HRM context. Fourth, future research might look at how workers' flexibility and resilience will be impacted by new technology. Future research must examine the psychological concerns brought on by evolving technologies, and it would be helpful to gain insight into how different HR strategies could reduce these issues for employees. It should be observed that several of the obstacles listed in Table 1 have a strong tendency to drive other obstacles, which could result in a domino effect within a system. To determine which obstacle is the most important and needs to be removed first, it will be instructive to examine the hierarchy and dependencies among the barriers to using AI in HRM. Finally, future research can look at the interaction between driving (training, supportive environment, collaboration, communication, performance improvement) and impending (possible resistance to change, fear of job loss, organizational inertia) forces on the interaction between AI and human workers.

References

- Abdeldayem MM, Aldulaimi SH (2020) Trends and opportunities of artificial intelligence in human resource management: aspirations for public sector in Bahrain. *Int J Sci Technol Res* 9(1):3867–3871.
- Acedo FJ, Barroso C, Casanueva C, Galán JL (2006) Co-authorship in management and organizational studies: an empirical and network analysis. *J Manag Stud* 43(5):957–983.
- Anderson N (2003) Applicant and recruiter reactions to new technology in selection: a critical review and agenda for future research. *Int J Sel Assess* 11(2/3):121–136.
- Angrave D, Charlwood A, Kirkpatrick I, Lawrence M, Stuart M (2016) HR and analytics: why HR is set to fail the big data challenge. *Hum Res Manag J* 26(1):1–11.
- Arslan, A., Ruman, A., Naughton, S. and Tarba, S.Y. (2021), “Human dynamics of automation and digitalisation of economies: discussion on the challenges and opportunities”, in Park, S.H., Gonzalez-Perez, M.A. and Floriani, D.E. (Eds), *The Palgrave Handbook of Corporate Sustainability in the Digital Era*, Palgrave Macmillan (Springer Nature), pp. 613-629.
- Arthanat, S., Vroman, K.G., Lysack, C. and Grizzetti, J. (2019), “Multi-stakeholder perspectives on information communication technology training for older adults: implications for teaching and learning”, *Disability and Rehabilitation: Assistive Technology*, Vol. 14 No. 5, pp. 453-461.
- Backlund, P., MaurinSeoderholm, H., Engström, H., Andersson Hagiwara, M. and Lebram, M. (2018), “Breaking out of the bubble putting simulation into context to increase immersion and performance”, *Simulation and Gaming*, Vol. 49 No. 6, pp. 642-660.
- Bawden, D. and Robinson, L. (2009), “The dark side of information: overload, anxiety and other paradoxes and pathologies”, *Journal of Information Science*, Vol. 35 No. 2, pp. 180-191.
- Bednar, P.M. and Welch, C. (2020), “Socio-technical perspectives on smart working: creating meaningful and sustainable systems”, *Information Systems Frontiers*, Vol. 22, pp. 281-298.
- Bitkina, O.V., Jeong, H., Lee, B.C., Park, J., Park, J. and Kim, H.K. (2020), “Perceived trust in artificial intelligence technologies: a preliminary study”, *Human Factors and Ergonomics in Manufacturing and Service Industries*, Vol. 30 No. 4, pp. 282-290.
- Block JH, Fisch C (2020) Eight tips and questions for your bibliographic study in business and management research. *Manag Rev Q* 70(3):307–312.
- Blondel VD, Guillaume JL, Lambiotte R, Lefebvre E (2008) Fast unfolding of communities in large networks. *J Stat Mech Theory Exp* 10:P10008.
- Bondarouk T, Brewster C (2016) Conceptualising the future of HRM and technology research. *Int J Human Resource Management* 27(21):2652–2671.
- Brockmann P, Schuhbauer H, Hinze A (2019) Diversity as an Advantage: An Analysis of Career Competencies for IT Students. In: 16th international conference cognition and exploratory learning in digital age, CELDA, pp 209–216.
- Brynjolfsson E, Mitchell T (2017) What can machine learning do? Workforce implications. *Science* 358:1530–1534. <https://doi.org/10.1126/science.aap8062>
- Brin S, Page L (1998) The anatomy of a large-scale hypertextual web search engine. *ComputNetw ISDN Syst* 30:107–117.

Canaan, R., Salge, C., Togelius, J. and Nealen, A. (2019), "Leveling the playing field: fairness in AI versus human game benchmarks", Proceedings of the 14th International Conference on the Foundations of Digital Games, pp. 1-8.

Castelfranchi, C. and Falcone, R. (2010), *Trust Theory: A Socio-Cognitive and Computational Model*, John Wiley & Sons, Hoboken, NJ.

Coupe, T. (2019), "Automation, job characteristics and job insecurity", *International Journal of Manpower*, Vol. 40 No. 7, pp. 1288-1304.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1003.

Davison, H.K., Maraist, C. and Bing, M.N. (2011), "Friend or foe? The promise and pitfalls of using social networking sites for HR decisions", *Journal of Business and Psychology*, Vol. 26 No. 2, pp. 153-159.

Demir, M., McNeese, N.J. and Cooke, N.J. (2020), "Understanding human-robot teams in light of all-human teams: aspects of team interaction and shared cognition", *International Journal of Human-Computer Studies*, Vol. 140, 102436.

Derks, D., Van Duin, D., Tims, M. and Bakker, A.B. (2015), "Smartphone use and work-home interference: the moderating role of social norms and employee work engagement", *Journal of Occupational and Organisational Psychology*, Vol. 88 No. 1, pp. 155-177.

Digital Transformation in Business and Society, Palgrave Macmillan, Cham, pp. 127-143.

Driskell, J.E., Salas, E. and Driskell, T. (2018), "Foundations of teamwork and collaboration", *American Psychologist*, Vol. 73 No. 4, pp. 334-38.

Evjemo, L.D., Gjerstad, T., Grøtli, E.I. and Sziebig, G. (2020), "Trends in smart manufacturing: role of humans and industrial robots in smart factories", *Current Robotics Reports*, Vol. 1 No. 2, pp. 35-41.

Fitzgerald, M., Kruschwitz, N., Bonnet, D. and Welch, M. (2014), "Embracing digital technology: a new strategic imperative", *MIT Sloan Management Review*, Vol. 55 No. 2, pp. 1-12.

Forbes (2019), "Ten HR trends in the age of artificial intelligence", available at: <https://www.forbes.com/sites/jeannemeister/2019/01/08/ten-hr-trends-in-the-age-of-artificial-intelligence/?sh55794538c3219> (accessed 14 April 2021).

Gibbs, C., MacDonald, F. and MacKay, K. (2015), "Social media usage in hotel human resources: recruitment, hiring and communication", *International Journal of Contemporary Hospitality Management*, Vol. 27 No. 2, pp. 170-184.

Gillath, O., Ai, T., Branicky, M.S., Keshmiri, S., Davison, R.B. and Spaulding, R. (2021), "Attachment and trust in artificial intelligence", *Computers in Human Behavior*, Vol. 115, 106607.

Glikson, E. and Woolley, A.W. (2020), "Human trust in artificial intelligence: review of empirical research", *Academy of Management Annals*, Vol. 14 No. 2, pp. 627-660.

Golembiewski, R. (2019), "Development, transition, or transformation", in Golembiewski, R. (Ed.), *Handbook of Organisational Consultation*, 2nd ed., Routledge, New York, NY, pp. 60-76.

Harrington, K.V., McElroy, J.C. and Morrow, P.C. (1990), "Computer anxiety and computer-based training: a laboratory experiment", *Journal of Educational Computing Research*, Vol. 6 No. 3, pp. 343-358.

Harvard Business Review, Vol. 96 No. 4, pp. 114-123.

Henfridsson, O., Mathiassen, L. and Svahn, F. (2014), "Managing technological change in the digital age: the role of architectural frames", *Journal of Information Technology*, Vol. 29 No. 1, pp. 27-43.

Hmoud, B. and Laszlo, V. (2019), "Will artificial intelligence take over human resources recruitment and selection", *Network Intelligence Studies*, Vol. 7 No. 13, pp. 21-30.
Holland, P. and Anne Bardoel, A. (2016), "The impact of technology on work in the twenty-first century: exploring the smart and dark side", *The International Journal of Human Resource Management*, Vol. 27 No. 21, pp. 2579-2581.

Hudson, S., Matson-Barkat, S., Pallamin, N. and Jegou, G. (2019), "With or without you? Interaction and immersion in a virtual reality experience", *Journal of Business Research*, Vol. 100, pp. 459-468.

Ivanov, S. and Webster, C. (2019), *Robots, Artificial Intelligence and Service Automation in Travel, Tourism and Hospitality*, Emerald Publishing, Bingley.

Kaplan, A. and Haenlein, M. (2019), "Siri, Siri, in my hand: who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence", *Business Horizons*, Vol. 62 No. 1, pp. 15-25.

Kim, M.J., Kim, K.J., Kim, S. and Dey, A.K. (2018), "Performance evaluation gaps in a real-time strategy game between human and artificial intelligence players", *IEEE Access*, Vol. 6, pp. 13575-13586.

KPMG (2019), "Rise of the humans 3: shaping the workforce of the future", available at: <https://assets.kpmg/content/dam/kpmg/XX/pdf/2018/11/rise-of-the-humans-2019.pdf>.

Larivière, B., Bowen, D., Andreassen, T.W., Kunz, W., Sirianni, N.J., Voss, C. and De Keyser, A. (2017), "'Service encounter 2.0': an investigation into the roles of technology, employees and customers", *Journal of Business Research*, Vol. 79, pp. 238-246.

Libert, K., Mosconi, E. and Cadieux, N. (2020), "Human-machine interaction and human resource management perspective for collaborative robotics implementation and adoption", *Proceedings of the 53rd Hawaii International Conference on System Sciences*, available at: <https://scholarspace.manoa.hawaii.edu/bitstream/10125/63805/0053.pdf>.

Maitlis, S. and Ozcelik, H. (2004), "Toxic decision processes: a study of emotion and organisational decision making", *Organization Science*, Vol. 15 No. 4, pp. 375-393.

Malik, A., Budhwar, P. and Srikanth, N.R. (2020), "Gig economy, 4IR and artificial intelligence: rethinking strategic HRM", *Human & Technological Resource Management (HTRM): New Insights into Revolution 4.0*, Emerald Publishing, Bingley.

Mariappanadar, S. and Aust, I. (2017), "The dark side of overwork: an empirical evidence of social harm of work from a sustainable HRM perspective", *International Studies of Management and Organization*, Vol. 47 No. 4, pp. 372-387.

Mattessich, P.W. and Monsey, B.R. (1992), "Collaboration: what makes it work", *A Review of Research Literature on Factors Influencing Successful Collaboration*, Wilder Foundation, Amherst HSt. Paul, MN.

Mikkelsen, A., Øgaard, T., Lindøe, P.H. and Olsen, O.E. (2002), "Job characteristics and computer anxiety in the production industry", *Computers in Human Behavior*, Vol. 18 No. 3, pp. 223-239.

Mitchell, J.I., Gagné, M., Beaudry, A. and Dyer, L. (2012), "The role of perceived organisational support, distributive justice and motivation in reactions to new information technology", *Computers in Human Behavior*, Vol. 28 No. 2, pp. 729-738.

Mohanta, B., Nanda, P. and Patnaik, S. (2020), "Management of v. UCA (volatility, uncertainty, complexity and ambiguity) using machine learning techniques in industry 4.0 paradigm", in Patnaik, S. (Ed.), *New Paradigm of Industry 4.0: Internet of Things, Big Data & Cyber-Physical Systems*, Springer International Publishing, Cham, pp. 1-24.

Moore, T. (2018), *The Disposable Workforce: Worker Displacement and Employment Instability in America*, Routledge, New York, NY.

Mosco, V. (2016), "Marx in the cloud", *Marx in the Age of Digital Capitalism*, Brill, Leiden, pp. 516-535.

Nica, E., Miklencicova, R. and Kicova, E. (2019), "Artificial intelligence-supported workplace decisions: big data algorithmic analytics, sensory and tracking technologies, and metabolism monitors", *Psychosociological Issues in Human Resource Management*, Vol. 7 No. 2, pp. 31-36.

Novak, E. and Wisdom, S. (2018), "Effects of 3D printing project-based learning on preservice elementary teachers' science attitudes, science content knowledge, and anxiety about teaching science", *Journal of Science Education and Technology*, Vol. 27 No. 5, pp. 412-432.

Okumus, F., Bilgihan, A., Ozturk, A.B. and Zhao, X. (2017), "Identifying and overcoming barriers to deployment of information technology projects in hotels", *Journal of Organizational Change Management*, Vol. 30 No. 5, pp. 744-766.

Paruzel, A., Bentler, D., Schlicher, K.D., Nettelstroth, W. and Maier, G.W. (2020), "Employees first, technology second", *Zeitschrift für Arbeits- und Organisationspsychologies*, Vol. 64 No. 1, pp. 46-57.

Petriglieri, G., Ashford, S.J. and Wrzesniewski, A. (2019), "Agony and ecstasy in the gig economy: cultivating holding environments for precarious and personalised work identities", *Administrative Science Quarterly*, Vol. 64 No. 1, pp. 124-170.

Peysakhovich, A. and Naecker, J. (2017), "Using methods from machine learning to evaluate behavioral models of choice under risk and ambiguity", *Journal of Economic Behavior and Organization*, Vol. 133, pp. 373-384.

Pueyo, S. (2018), "Growth, degrowth, and the challenge of artificial superintelligence", *Journal of Cleaner Production*, Vol. 197, pp. 1731-1736.

Richards, G., Yeoh, W., Chong, A.Y.L. and Popovič, A. (2019), "Business intelligence effectiveness and corporate performance management: an empirical analysis", *Journal of Computer Information Systems*, Vol. 59 No. 2, pp. 188-196.

Rodney, H., Valaskova, K. and Durana, P. (2019), "The artificial intelligence recruitment process: how technological advancements have reshaped job application and selection practices", *Psychosociological Issues in Human Resource Management*, Vol. 7 No. 1, pp. 42-47.

Rogers, E. (1995), *Diffusion of Innovations*, 4th ed., Free Press, New York.

Sampson, J.P., Kettunen, J. and Vuorinen, R. (2020), "The role of practitioners in helping persons make effective use of information and communication technology in

career interventions”, *International Journal for Educational and Vocational Guidance*, Vol. 20 No. 1, pp. 191-208.

Schaefer, K. (2013), “The perception and measurement of human-robot trust”, PhD Thesis, University of Central Florida, available at: http://etd.fcla.edu/CF/CFE0004931/Schaefer_Kristin_E_201308_PhD.pdf.

Seeber, I., Bittner, E., Briggs, R.O., de Vreede, T., De Vreede, G.J., Elkins, A., Maier, R., Merz, A.B., Oeste-Rei, S., Randrup, N., Schwabe, G. and Sollner, M. (2020), “Machines as teammates: a research agenda on AI in team collaboration”, *Information and Management*, Vol. 57 No. 2, 103174, doi: 10.1016/j.im.2019.103174.

Serban, A., Yammarino, F.J., Dionne, S.D., Kahai, S.S., Hao, C., Mchugh, K.A., . . . and Peterson, D.R. (2015), “Leadership emergence in face-to-face and virtual teams: a multi-level model with agent- based simulations, quasi-experimental and experimental tests”, *The Leadership Quarterly*, Vol. 26 No. 3, pp. 402-418.

Shen, J., Zhang, C.J., Jiang, B., Chen, J., Song, J., Liu, Z., He, Z., Wong, S.Y., Fang, P.H. and Ming, W.K. (2019), “Artificial intelligence versus clinicians in disease diagnosis: systematic review”, *JMIR Medical Informatics*, Vol. 7 No. 3, e10010, d.

Sivathanu, B. and Pillai, R. (2018), “Smart HR 4.0 – how industry 4.0 is disrupting HR”, *Human Resource Management International Digest*, Vol. 26 No. 4, pp. 7-11.

Smids, J., Nyholm, S. and Berkers, H. (2020), “Robots in the workplace: a threat to—or opportunity for—meaningful work?”, *Philosophy and Technology*, Vol. 33 No. 3, pp. 503-522.

Spencer, A.J., Buhalis, D. and Moital, M. (2012), “A hierarchical model of technology adoption for small owner-managed travel firms: an organisational decision-making and leadership perspective”, *Tourism Management*, Vol. 33 No. 5, pp. 1195-1208.

Strohmeier, S. and Piazza, F. (2015), “Artificial intelligence techniques in human resource management—a conceptual exploration”, *Intelligent Techniques in Engineering Management*, Springer, Cham, pp. 149-172.

Sutherland, W., Jarrahi, M.H., Dunn, M. and Nelson, S.B. (2020), “Work precarity and gig literacies in online freelancing”, *Work, Employment and Society*, Vol. 34 No. 3, pp. 457-475.

Tsarouchi, P., Michalos, G., Makris, S., Athanasatos, T., Dimoulas, K. and Chryssolouris, G. (2017), “On a human-robot workplace design and task allocation system”, *International Journal of Computer Integrated Manufacturing*, Vol. 30 No. 12, pp. 1272-1279.

van den Heuvel, S. and Bondarouk, T. (2017), “The rise (and fall?) of HR analytics: a study into the future application, value, structure, and system support”, *Journal of Organizational Effectiveness: People and Performance*, Vol. 4 No. 2, pp. 157-178.

Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A. and Trichina, E. (2021), “Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review”, *International Journal of Human Resource Management*, Early view

Webster, C. and Ivanov, S. (2020), “Robotics, artificial intelligence, and the evolving nature of work”,

Webster, J. and Martocchio, J.J. (1992), “Microcomputer playfulness: development of a measure with workplace implications”, *MIS Quarterly*, Vol. 16 No. 2, pp. 201-226.

Wilson, H.J. and Daugherty, P.R. (2018), “Collaborative intelligence: humans and AI are joining forces”,

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Dr. Aajaz Ahmad Hajam Alphonsa S John,

Dar, S. A., Muthukumar, J., & Reshi, I. A. (2023). KASHMIRI WOMEN AS THE AGENT OF CLIMAT CHANGE. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEAS)*, 3(1), 213-216.

Reshi, I. A., & Sudha, T. (2023). Women's Economic Involvement and Self-Help Groups in the Pulwama District of Jammu and Kashmir. *MORFAI JOURNAL*, 2(4), 872-882.

Reshi, I. A., & Sudha, T. (2023). Women's Economic Involvement and Self-Help Groups in the Pulwama District of Jammu and Kashmir. *MORFAI JOURNAL*, 2(4), 872-882.

Reshi, I. A. (2023). COVID-19 Pandemic and Teaching and Learning: A Literature Review. *MORFAI JOURNAL*, 2(4), 820-826.