



Technological Disruptions and Their Implications on Human Resource Management

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Abstract: As industries evolve from Industry 4.0 to Industry 5.0, an augmented approach to aligning man and machine for organisational effectiveness becomes evident. It has refined the world of work and Human Resource Management (HRM). By aligning with the Industrial Revolutions, based on previous research, this paper highlights the impact of globalisation and technological disruptions on the world of work today. The study highlights the shift from working at office to hybrid style of working and its critical challenges faced by employees. Furthermore, the study emphasizes

the necessity for organizations, especially for the HRM, to adapt to more human-centric and sustainable policies and practices for the evolving world of work. The well-being of employees needs to be a focus for HRM along with continually training them to keep pace with the changes caused by technological advancements. The authors propose a few frameworks and adaptive strategies to integrate the multi-generational workforce that co-exists today.

Keywords: Digitalisation, Emerging HR, Talent Management, Wellness, Workforce Diversity

1. Introduction

Today, we live in a world that was unpredictable a decade ago. Constant social, economic, environmental, and geopolitical disruptions have reshaped our lives. A constant reminder of uncertainty hangs, manifesting various reactions. The COVID-19 Pandemic, in particular, accelerated this transformation and prompted people to rethink how they connect and conduct business, hence changing the world of work. Remote and hybrid work, which was unusual, has become standard across industries.

Technology that was once an enabler has now taken centre stage in business operations and enhanced global businesses to work together.

Looking back, in the 1960s, when digitalisation began, the world we live in today would have been beyond belief (Kraus et al. 2021). During the 1980s, globalisation evolved as a critical phenomenon accelerated by digitalisation (Vanham 2019). Ever since, businesses have used digital technologies to enhance operations and performance (Kraus et al. 2021). These changes parallel the Industrial Revolution. Just as the First Industrial Revolution introduced machines to speed up production and the Second brought mass production and electricity, the Third Industrial Revolution pioneered digitalisation. The Fourth Industrial Revolution (Gilchrist 2016) started focusing on advancements in technology and business processes (Santhi and Muthuswamy 2023). It is characterized by digitization, automation, and machine learning (Gilchrist 2016) among others, to create more efficient and agile organizations (Yang & Gu 2021). Industry 5.0 has emerged recently and prioritised the need for man and machine to work together to enhance productivity and efficiency (Adel 2022).

Alongside globalisation and technological disruptions through the Industrial Revolution, people management has also transformed significantly

(Ammirato et al., 2023). According to Porter (1985), technology has the power to drive competition, and in today's globalised workplaces, where competition spans borders, adapting to technological advancements has become imminent. However, since the Industrial Revolution 4.0, the focus has also been on the welfare of the people involved (Ammirato et al., 2023). For organisations to find balance in human-machine augmentation, it appears HRM needs to adapt and provide employees with resources to upskill and thrive in the ever-disruptive work context.

2. Industrial Revolutions

The narratives of the world of work have changed, since the emergence of various industrial revolutions. In the eighteenth century, the first Industrial Revolution (Industry 1.0) showed a shift from manually made goods to one with machinery, centring on water and steam power (Adel 2022; Schwab 2016; Akundi et al. 2022). Industry 2.0 (Akundi et al. 2022), the next revolution focused on mass production by replacing men and focusing on efficiency and productivity with machinery in the manufacturing industry. The third revolution (Industry 3.0)(Akundi et al. 2022) focused on transmitting information through the spread of computers (Adel 2022). 'Industry 4.0' introduced by the German government (Coelho, et al. 2023) focused on technological advancements such Industrial Internet of Things (IIoT) (Gilchrist 2016), Cybersecurity, Cloud Computing, Machine Learning (ML), Artificial Intelligence (AI) and Augmented Reality among others (Rüßmann et al. 2015; Xu 2020; Santhi and Muthuswamy

2023; Akundi et al. 2022; Schwab 2016).

This Revolution disrupted multiple industries, resulting in critical social challenges (Santhi and Muthuswamy 2023), automating manufacturing processes and workflow while transforming various systems, including production, management, and governance. This innovative combination of technology questioned how business leaders and executives worked, urging them to understand the ever-changing environment and encouraging them to continue innovation (Schwab 2016; Longo et al. 2020).

Complementing the features of Industry 4.0, Industry 5.0 goes beyond. Industry 5.0's vision is to recognize the industry's capacity to contribute to society. This goes beyond jobs, placing workers at the centre, looking at well-being and lifelong learning, shifting from a technology-driven 4.0 industry to a sustainable, resilient, and human-centric perspective (Xu et al. 2021; Zizic et al. 2022; European Commission, Directorate-General for Research and Innovation 2021). Human integration in the current digital revolution has the potential to decipher new understanding and levels of innovation, productivity, and empowerment (European Commission, Directorate-General for Research and Innovation 2021; Nahavandi 2019). Although Industry 5.0 is yet to be entirely accepted by all industry leaders, it envisions a different path of digitalisation through human-digital collaboration, implying the need for the human touch (Santhi & Muthuswamy, 2023). This touch of empathy, intelligence, creativity and decision-making, along with automation, empowers humans for the further benefit of the organisations (Kyriakakis 2024; Nahavandi 2019; Wolniak 2023).

Table 1: Transitioning Industry 1.0 to 5.0

Sl. No.	Industry	Aspects	Core ideas
1.	Industry 1.0	<ul style="list-style-type: none"> • Water and steam generated power • Machines for processes • Textile and manufacturing industry 	Manual labour to machinery
2.	Industry 2.0	<ul style="list-style-type: none"> • Electricity as a new source • Steel and chemicals • Better transportation, railroads 	Advances and improvement for efficiency and mass production
3.	Industry 3.0	<ul style="list-style-type: none"> • Inventions • Electronic devices, computers • Automations 	Technology and digital logic
4.	Industry 4.0	<ul style="list-style-type: none"> • Big data and analytics, robots, simulation, integration of horizontal and vertical systems, industrial internet of things , cybersecurity, cloud, additive manufacturing (3D printing), Machine Learning (ML), Artificial Intelligence (AI) and augmented reality 	Technologically driven and connected, cyberphysical systems
5	Industry 5.0	<ul style="list-style-type: none"> • Possible newer technologies include artificial intelligence of things, smart sensors, smart sensors, 6G and beyond 	Human- machine collaboration, society and environment centric

Sources: (Adel 2022; Akundi et al. 2022; Nahavandi 2019; Nousala and Metcalf 2024; Show et al. 2021; Rießmann et al. 2015; Santhi and Muthuswamy 2023; Xu et al. 2021; Xu 2020)

The new revolution brings in the synergy that caters to human efficiency and goes beyond transforming the world of work (Nahavandi 2019). It is quite well accepted that this world is everchanging, unleashing the modern reality of uncertainty. Evolving from the concept of Volatile, Uncertain, Complex, Ambiguous (VUCA) (Johansen 2012), the concept of BANI (Brittle, Anxious, Non-Linear, and Incomprehensible) presented by Jamais Cascio in

2020, fits best in the complexity and dynamism of the current global scenario. The BANI world is affected by geopolitical disruptions, geoeconomic fragments, technological disruptions, and climatic disruptions, which drive declining and emerging jobs (World Economic Forum 2025). Both VUCA and BANI concepts have reinforced the significance of the disruptions taking place and the implication on leaders in general and HRM in particular. It is evident to acknowledge the shifting focus with the priority role of Human Resource Management(HRM) toward building human-centric, sustainable, and resilient organisations.

3. HRM from Past to Present

According to Kamruzzaman et al. (2022), traditional HRM was process-oriented, and the overarching focus was on the processes and procedures from hiring to exiting an individual in an organization. However,

it has changed in the current VUCA-BANI world, which is surrounded by uncertainties and demands for organisational goals and strategy changes. Ulrich (2016) emphasizes the need for HRM to focus on relationships and empowering the people involved rather than sticking to traditional processes. According to Ammirato et al. (2023), this change can also be linked to the level of competitiveness that came with technological advancements. According to the authors, HRM at the organisational level could alter its focus with strategies to have an edge in the ever-disruptive world of work (see Table 2).

Table 2: Traditional HRM vs HRM today

	Traditional HRM	HRM Today
Focus	Operational efficiency	People-focused and achieve strategic organisational goals
Approach	Reactive	Proactive
Role of HR Professionals	Administrative functions like recruitment, payroll, and compliance.	Strategic partners are involved in decision-making processes and contribute to business strategy.

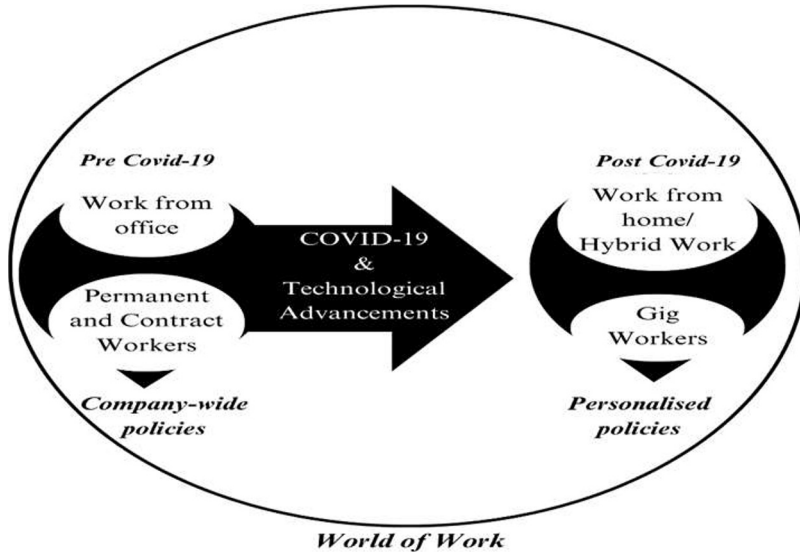
Source: (Ulrich 2016)

3.1. Key Areas of HR Affected by Technological Disruption

Technological disruptions are anticipated to disrupt workers and the working environment, impacting job creation, destruction, and transformation along structures and models of businesses and organizations (Healy et al., 2017). These disruptions have transformed HR focus, shifting to a more people-centric and efficient approach for the survival of the organization (Stanley & Aggarwal, 2019). HRM is crucial in navigating multiple arenas affected by this technological disruption and is thus an important focus for organisations. While there are multiple areas in HRM, the authors have chosen to focus on specific aspects due to their focus on the work environment and employees. While these disruptions continuously challenge an organization's survival, there is a need to adapt and equip employees to thrive in this VUCA and BANI world, where technological disruptions will bring unthinkable changes. The focus of this paper includes

the global workforce shift leading to understanding the importance of employee well-being, DEI initiatives, talent management, and learning and development.

After the Covid-19 pandemic, the workforce has been transformed (see Figure 1) (Wheatley et al. 2023). Alongside the health crisis, various workers were forced by management to work from home, normalising the remote and hybrid workforce (Vyas 2022). With the broadening access to the internet, various countries are shifting focus to employees and integrating remote workers into their workforce (World Economic Forum, 2025). Remote and hybrid work have helped people to work across borders. There are benefits for both employee and employer such greater employee autonomy, among others (Wheatley et al. 2023).

Figure 1: World of Work

While this has impacted work positively, it has also impacted employees' subjective well-being, especially those in the Gig Economy. Workers have trouble separating professional and personal life, neglecting commitments while feeling tense and anxious (Vučković et al. 2023). Employees have also reported burnout due to high workloads and work hours with few breaks (Wheatley et al. 2023). Employees' wellbeing, work and life boundaries are adversely affected by constant work emails post working hours (Tedone 2022). A sudden shift to remote work and rapid introduction to AI at the workplace could lead to employee loneliness, affecting their well-being, health and impacting organization. It is an emerging challenge at the

workplace which needs attention, not only by organization, leaders, manager, but also HRM to take specific HR interventions (Patel et al. 2025; Becker et al. 2022). In addition, the compelling need to continuously equip themselves alongside technological advancements has increased stress and other adverse health impacts among employees. Late-career employees find it more difficult than younger employees to work with technology that negatively impacts their performance and leads to stress and anxiety (Tams 2024). Because of digital toxicity many employees today are in a constant state of alertness, which might lead to Technostress. 'Technostress' as an emerging terminology is the stress caused by an individual's lack of ability to keep up with information technology (Ragu-Nathan et al. 2008; D'Arcy et al. 2014). Information overload and multitasking are some of the common causes of Technostress and that appear to be impacting employees' organizational and personal lives.

Over the years, an aggregate of social, political, and technological changes have made Diversity, Equity, and Inclusion (DEI) a chief talking point, and companies are constantly working on figuring out what works for them (Pedulla 2020). In addition to the diversity in terms of gender and race that prevailed, today, companies are expanding their operations worldwide, and thus, there is multicultural diversity (Prakash et al. 2024). Research by Forbes (2025) shows that while most companies are now curbing their DEI commitments, some still stand firm.

3.2. Current HRM Focus

In the current state, organizations must quickly adapt to the changes caused by technologies, seize opportunities, and re-configure themselves to sustain and flourish (O'Reilly & Tushman 2011). Organisations need to alter various aspects, including the management of their people. In such situations, leaders are enablers and guide the organisation towards a more augmented world of work where humans and machines collaborate. Integrating humans and machines has given rise to E-leadership, a leadership process of social influence using Advanced Information Technology (AIT). AIT has altered how leaders interact with their teams and led to virtual teams, where leadership must adapt to managing individuals who may never meet face-to-face (Avolio et al. 2014). As a bridge between the organisation and its people, HR professionals are indispensable assets and add value to current business settings (Ulrich 2016).

HR professionals attract, develop, and retain the people best suited for the organization ;often termed Talent Management. In the ever-disruptive business landscape, rapidly moving talent among different projects while ensuring employees have a positive experience is a significant task that HR professionals can not overlook (McKinsey & Company 2023). According to Kane et al. (2016), in the current digital era, coupled with limited resources and, thus, competition, HRs need to focus on aligning their people and culture with the organisational goals. Recently, talent markets based on digital platforms have become more prominent. LinkedIn, for example, is a professional networking site that functions as a digital talent marketplace. The ease of such a scenario has enhanced gig and contract working opportunities. The entire Talent Management aspect of HR has evolved and gotten enhanced attention in today's digitally driven work world (Cappelli and Keller 2014).

For leveraging Talent Management, HR needs to focus on enhancing the value of the employees through Performance Management. Strong performance management systems are invaluable in clarifying current performance and the career ahead during such ever-evolving business periods. With the recent shift from individual to group performance and continuous feedback, a standard performance management system that fits all employees has become redundant (McKinsey & Company 2024; Tripathi et al. 2021). Kim and Zitek (2024) say that organisations in the digital era have a new approach to performance reviews comprising narrative and numerical feedback. This process motivates employees as it balances getting feedback

without making them feel judged. The virtual workspace has brought in challenges of trust, productivity, and measuring performance; ensuring clarity in communication has become integral. The above includes efforts from management and the employees to measure and enhance performance (i.e.,) employers must communicate the expectations, and employees must constantly clarify when virtual communication is ineffective. While doing so, both parties must be mindful of clear and respectful communication. It involves sharing positives and negatives to enhance employee performance and engagement (Parisi et al. 2022). Certain companies such as Adobe, Deloitte, Netflix, Cardinal Health and Microsoft reflect a trend of reforming performance management systems and processes, creating a more forward-oriented approach to foster employee development with a growth mindset. Furthermore, these companies are shifting from formal annual goal setting, performance appraisal, focus only on individual performance, ranking among employees into making goal revision or frequent goal settings, regular checkins(feedback), absolute performance evaluation, performance rating on multiple dimensions, and focus on teamwork (Schröder-Hansen & Hansen 2022; Tripathi et al. 2021; Deloitte 2025).

In the virtual and hybrid workplace, to create human-centric and sustainable organizations amidst technological advancements, HRM needs to center around the wellness of employees. Work Well-being of an employee dives more profoundly than just physical health; it encompasses a holistic approach towards health (Meister 2021). Mindfulness is one way to achieve employee well-being; it is a protective factor in changing times (Schultz et

al. 2014). It is a protective factor because mindfulness would equip employees to navigate the VUCA and BANI world. In the hybrid workforces, mindfulness will also help employees to disconnect from work, balance work and life, manage screen fatigue and improve attention (Barrios and Pitt 2021). Centering on mindfulness practices would thus aid employee wellness. According to Vaidyanathan and Mahapatra (2020), HR professionals are principal enablers in enhancing employee wellness that drives employee engagement and productivity.

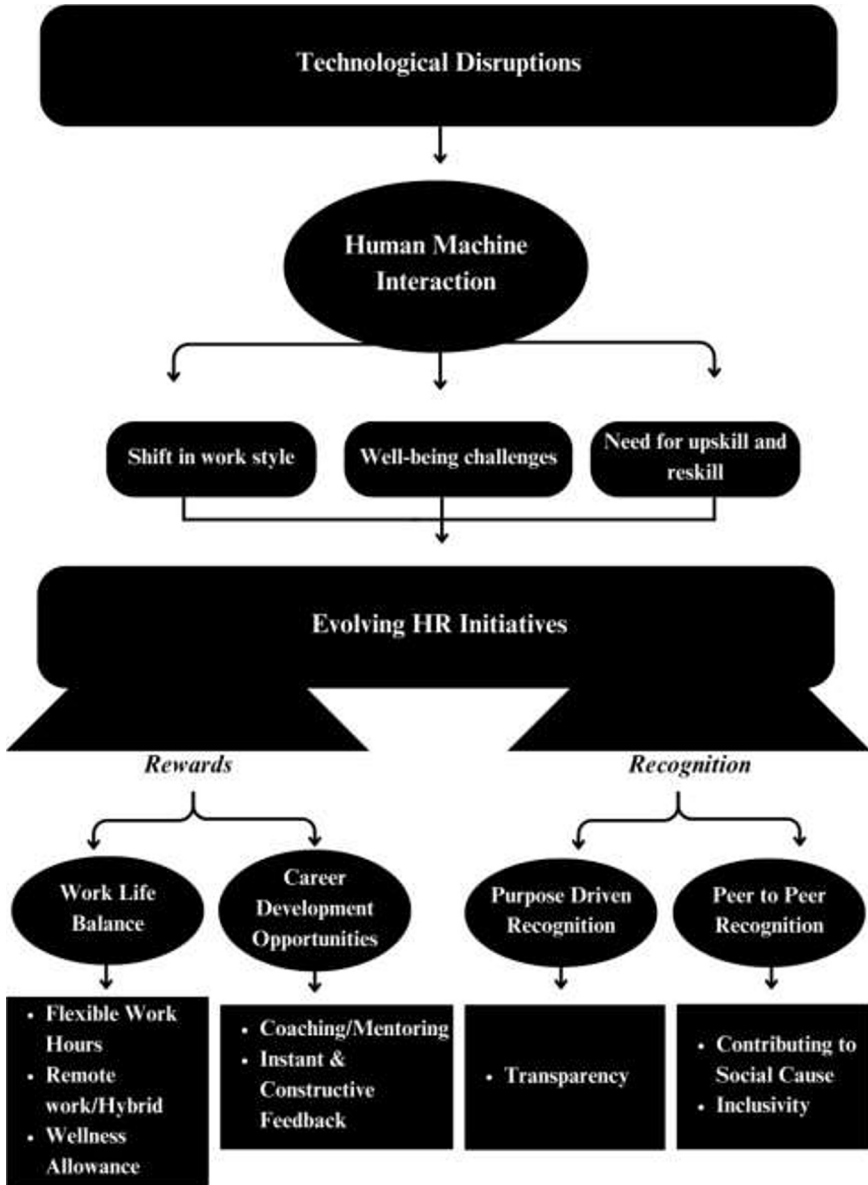
In the current state, providing support starts by helping employees overcome the resistance to change caused by many factors, including fear of job loss due to replacement by technology. HR professionals need to create awareness about the positive impact of human-machine collaboration for better organisational performance. With clear communications of human-machine interaction, the advantages can be articulated and enhanced trust can be established. Furthermore, employee resilience in the VUCA and BANI world can be built through the organization's value for work and the contribution of employees while fostering continuous learning, alignment with goal clarity, and inclusion, thus creating a mindset that contributes to the overall well-being of an employee (Kuntz et al. 2017; Hopkins and Bardoel 2023). Creating a supportive environment is one important area of focus. An autonomy-supportive environment is another way to reduce psychological need frustration where employees do not feel deprived of their needs (Schultz et al. 2014). Bardoel et al. (2014) focus on HR policies that can enhance employee performance while contributing to employees'

psychological behaviour and attitudes in times of chaos. The resilience-building resources leaders can use are social support, diversity management, work-life balance, flexible working, or resilience training to adapt realities, make meaning and withstand the changing situations (Coutu, 2002). Kossek (2016) focuses on strategies organisations can use to help employees manage work-life balance. These include providing a flexible option to employees and embracing workplace diversity. A resilient employee can work in both chaotic and non-chaotic environments. An agile leader can go beyond resilience for coping and proactively anticipating change and respond to these changes preparing the team and organization for the future (Mahapatra et al. 2025). With the changes in the world of work, there is also a need to transform from being resilient to agile. Needing to quickly adapt to the rapidly evolving scenario and upskilling. Ludviga and Kalvina (2023), highlight organisational agility as a safety net that contributes to employee well-being through employee engagement.

Technological advancements have necessitated continuous reskilling and upskilling of employees (Gupta & Misra 2023). Such that, instead of working against technology, employers and employees need to work with the technology in an augmented manner (Davenport and Kirby 2015). The authors reinforce that organizations and HR could play a crucial role in periodically training employees to enhance their technological competence. Continuous learning can be the key to preparing for the future, focusing on hard and soft skills at all levels (McKinsey & Company 2023) and, for example, hiring leaders who are digitally literate to lead and periodically

training them on digital literacy that can be passed on to the team (Kane et al. 2019). Training can be delivered offline through workshops that collaborate with employees and technology teams, online where employees can learn at their own pace, or even hybrid (Arslan et al. 2021). During the training period, HR must provide the time required for employees to adjust and learn. In today's multi-generational workforce, this is particularly important for older employees (Špehar et al., 2021). Organisations can employ inter-generational knowledge transfer and reverse mentoring. While Gen Z, the generation slowly making up the future workforce, values continuous and inter-generational learning, as mentioned above, the rewards and recognitions they seek differ from the other generations at work (Mahapatra et al., 2022). Figure 2 shows the rewards and recognitions proposed by the authors to manage the new generation today.

Figure 2: Evolving HR Initiatives



The authors believe that organisational policies are central to navigating through all the above-mentioned shifts and, thus, suggest wider adoption of policies that include permanent, contract, and gig workers of all age groups (see Table 3).

Table 3: Suggestions for Evolving Employees

Focus	Policies	Explanation
Well-being	Well-being Framework	Develop a unified well-being framework (mental health resources, flexible schedules) available to all, irrespective of employment type.
Learning & Development	Universal Digital Literacy Initiatives	Host sessions on emerging technologies like AI, IoT, or blockchain for workers to ensure a digital transformation journey.
Reward and Recognition	Recognition Beyond Tenure	Recognize contributions from gig and contract workers and permanent employees to build an equitable work ethics.

Diversity, Equity, and Inclusion (DEI)	Diversity, Equity, and Inclusion Programs	Establish platforms for diverse voices from gig, contract, and permanent workers, focusing on multi-generational and multicultural inclusivity.
Diversity, Equity, and Inclusion (DEI)	Inclusive Communication Platforms	Use collaboration tools (e.g., Zoom, Slack, MS Teams) with clear protocols for transparency and accessibility across worker types.
Leadership	Dynamic Leadership Styles	Train leaders to adopt leadership styles that resonate with multi-generational and diverse worker needs.

4. Conclusion

As we look forward to the widespread acceptance of Industry 5.0, recognizing its effect brought in by globalization and digitalization, among other unprecedented events that have changed the world of work, is foundational. To the authors, it is evident that as employees have continued to be a core element in the changing world of work, HRM has also evolved alongside other phenomena from being process-oriented to today, people-centric. The future of human-machine integration coupled with multiple generations at work has made it mandatory for HRM to be enhanced, people-centric, and sustainable. In HRM, the need to become more people-centric has significantly changed the trajectory of Talent Management, which is now anchored on aligning people and strategies with organizational goals. HR professionals must prioritize the alignment of employees with the goals of the organization while simultaneously ensuring their well-being and growth. In addition, timely measures are needed to review performance and clarify the way forward. In increasingly diverse and hybrid workplaces, this is possible through impactful communication. Achieving a balance amongst the above dimensions is crucial for success in the digitally driven world.

In conclusion, HR policies and practices must focus on inclusion in the current business landscape. It is possible by empowering permanent, contract, and gig workers. By investing in the holistic well-being of existing employees, organizations can unlock the means to build organizational success. These policies and practices shape and prepare organisations for the

future of work. As the digital culture offers many benefits, there is evolution and a need to adapt to newer and more sustainable strategies, for which HRM needs to be adaptable.

5. Possible Areas of Future Research

Ongoing research has comprehensively studied the implications for HRM from Industry 1.0 and how they have evolved with the advancements in globalisation and technological disruptions. To the authors it appears, Industry 5.0 is yet to be entirely accepted in total. Further it needs to be adapted by many industries and HR leaders at an acceptable pace. The authors firmly believe that the future researchers could explore further on the varied impact of Industry 5.0 and its implications on HR strategies, policies and practices. HRM agility along with leadership agility could be a way forward to be studied extensively in the changing context.

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