

Original Article

HR Challenges in Industry 5.0 and Smart Workplaces: A Review of Emerging Issues and Future Directions

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ABSTRACT: Industry 5.0 represents a transformative paradigm that emphasizes human-centricity, resilience, and sustainability through the synergistic integration of advanced technologies and human capabilities. The emergence of smart workplaces has fundamentally reshaped the role of human resource management (HRM), creating new challenges related to workforce transformation, employee well-being, human-robot collaboration, ethical artificial intelligence, hybrid work arrangements, leadership development, and diversity management. Despite the growing body of literature on Industry 5.0, research addressing these issues from an integrated human resource perspective remains fragmented. Thus, this paper better utilizes a Systematic Literature Review (SLR) approach to develop an overarching view of academic literature articles from the period 2021 up to 2025 in several major databases: Scopus, Web of Science, ScienceDirect, SpringerLink, and MDPI. The paper uses thematic analysis to identify six main HRM challenges and contrasts how these could affect the organizational resilience and long-term performance. The research shows that building Industry 5.0 takes regular reskilling and upskilling, an employee-first well-being agenda, ethically responsible AI governance, adaptive leadership, and an inclusion culture in organizations. It also makes clear that smart workplaces with sustainable competitive advantage will be the ones that can leverage human values and corresponding organizational capabilities simultaneously vis-à-vis technological innovation. Theoretically, the review contributes to the emerging HRM 5.0 literature through a comprehensive framework for understanding people-technology interactions in intelligent workplaces that integrates Socio-Technical Systems Theory with Resource-Based View and Human-Centered Theory. On a practical level, the results offer strategic insights for HR managers and organizational leaders involved in digital transformation management, while policy implications underscore responsible AI governance, sustainable workforce formation, and augmentation as well as expansion of digital skills. The overarching aim of the study is a comprehensive understanding of HR issues in Industry 5.0 and to guide the future research towards establishing resilient, inclusive, and sustainable smart workplaces.

KEYWORDS: Industry 5.0, HRM 5.0, Smart Workplaces, Human-Centric Organizations, Human-Robot Collaboration, Ethical Artificial Intelligence, Employee Well-being, Sustainable Human Resource Management.

1. INTRODUCTION

Industry 5.0 represents the third industrial revolution, from technology-oriented Industry 4.0 to a human or resilient and sustainable Industry ecosystem. However, while earlier industrial revolutions have focused on automation and productivity, Industry 5.0 aims to merge advanced technologies, i.e., artificial intelligence (AI), collaborative robots (cobots), big data analytics, digital twins, and the Internet of Things (IoT) with human creativity / Human Intelligence in a sustainable way. With the advent of intelligent systems and closer connections, smart workplaces have evolved traditional human resource management practices. It is upon existing HR Departments to regulate the harmonious interface between humans and machines, while ensuring employee wellbeing, organisational sustainability, and workforce resilience. With the rapidly changing nature of work, organizations have re-imagined approaches to talent management, learning systems, and workplace structures to keep up with new technologies and employee expectations. As a result, the nature of HR has changed from an administrative function to a strategic partner in leading organisation-wide transformation. However, this transition comes with several challenges in terms of skill remediation, workforce flexibility, employee engagement, and ethical governance (Brougham & Haar, 2018; Oztemel & Gursev, 2020; Nahavandi, 2019).

The domain of human resource management needs to deal with large challenges in the process of reskilling and upskilling for Industry 5.0. The speed at which AI-based systems, robotics, and digital technologies are being executed has disrupted job requirements and brought about a critical abilities gap. This requires employees to build digital skills, analytical skills, and softer skills such as creative thinking, emotional intelligence, critical thinking, and collaboration. It presents a dilemma for organizations on how to design continuous learning programs that prepare their workforce while simultaneously staving off the change-resistance ardor. Why traditional training approaches don't work well, HR managers have already embraced personalized learning to meet the ever-changing demands of smart workplaces. Traditional training methods simply no longer help in such cases, as more and more content quickly gets out of date. So techniques like virtual simulation and an AI-based

training platform are becoming necessary for staying relevant in this fast-paced environment that modern businesses need to compete with one another successfully. In addition to this, technologies have elevated fears about job losses and worker insecurity by creating psychological impediments against the digital transformation. HR practitioners still need to provide re-skilling opportunities that balance automation with some human touchpoints in order to prepare the workforce to be co-pilots alongside AI, as well as maintain employability and organizational competitiveness. Industry 5.0 primarily relies on the capability of HR systems to foster a culture of learning and encourage employees to acquire new skills continuously (Schwab, 2016; Delery & Doty, 1996; Longo et al., 2025).

Another challenge that HR management in Industry 5.0 and smart workplaces faces is the ethical and regulatory problems. The use of Artificial Intelligence in recruitment, performance management, and decision-making is a cause for concern because of algorithmic bias, vulnerability, or lack of accountability, transparency, fairness, and data privacy. If they are not monitored and governed, AI systems can inadvertently replicate bias and social inequality. This is why it may be entrusted with the role of stewarding ethical governance and responsible innovation to HR departments tasked with steering Industry 5.0 environments (European Commission, 2021; Vyhmeister & Castane, 2024; Nahavandi, 2019).

Furthermore, to counter technological and ethical issues such as the third industrial revolution, which has also increased volatility, it requires a type of organizational culture transformation along with leadership styles and relationships between the workforce for organization 5.0. Smart workplaces involve humans working in concert with intelligent machines, prompting leaders to foster agility, inclusiveness, and always be in the process of change management. The Future of HRM will be in building resilient organizations that meet the challenge of advancing not only technological capabilities, but equally human experience values. Thus, encouraging organizations to invest in sustainability, employees, and resilience of human to machine collaboration that can create smart workplaces with a long-term innovation-oriented competitive advantage [8]. Thus, gaining insights into the struggles of HR in Industry 5.0 is imperative for planning organizational recovery and sustainable talent growth amidst digitalisation (Grabowska et al., 2022; Longo et al., 2025; Veeramani & Arunkumar, 2026).

2. REVIEW OF LITERATURE

Recent studies indicate a transition from Industry 4.0 to Industry 5.0, shifting away towards more human- and sustainability-centered workplaces. Xu Xia et al. According to Rahimifard et al. (2021), Industry 5.0 capitalizes on a philosophy of combining human intelligence, offering the potential for organizations to achieve maximum resilience and productivity through highly efficient collaborative partners between advanced technology and humans. Similarly, Leng J. et al. Human-Machine Collaboration, Sustainability, and Mass Personalization were the main features of the new industrial age, according to Chanda et. al.(2022). An exploratory study by Verma Anju & Venkatesan (2022) categorized HR factors influencing successful smart workplace implementation as talent acquisition, digital competencies, and skill development. Furthermore, Panagou Sotirios et al. (2023) demonstrated that efficient human-robot interaction can greatly influence operational efficiency and employee adaptability. Additionally, Kuru (2023) further explained that the important factors regarding workplace wellness and emotional intelligence play a primary role in ensuring workers are engaged throughout their employment in technologically accelerated environments. These studies reiterate the fact that HR practices need to be reformed perennially since they are faced with new workforce challenges in Industry 5.0.

Antonaci et al. According to (2024), employee welfare, cognitive ergonomics, and workplace safety are the core components of Industry 5.0, and organizations need to prioritize workers' physical and psychological health respectively. In the same direction, an analysis performed by Pacheco and Iwaszczenko (2024) found several tensions around automation, learning, safety, and organizational belonging; so they suggested that firms should develop resolution strategies that will overcome the automating technology with human values. Vyhmeister and Castane (2024) emphasised the importance of reliable artificial intelligence in industrial environments, where it is vital to ensure transparency, ethical governance, and safe use of AI [21]. Furthermore, Piccarozzi et al. As far as the definition of Industry 5.0 is concerned, according to (2024), sustainability and human welfare are prerequisites for its fundamental framework, while Mourtzis et al. (2022) listed digital twins, cybersecurity, and intelligent systems as major enablers for smart workplaces. In total, these studies highlight the need for ethical and employee-centric HR policies to manage technological transformation.

Longo et al. (2023) argued that HRM 5.0 needs to be regarded as a socio-technical architecture that can support organizations in being resilient, sustainable, and human centered (Strack et al.2025). They found key themes, including workforce empowerment, organizational structures, digital skills, and collaboration. Movahed et al. (2025) pointed out that human-driven production has become more central to smart factory production by driving advanced technologies and policy support. In a similar spirit, Fant-Male and Pieters (2025) highlight personalized human-robot collaboration and adaptive interactions to increase the employee experience as well as productivity at work. Recent reviews have also stressed the important role played by continuous learning and leadership support in enabling digital and green transitions. Future HR practices should be in the spotlight not only due to technological innovation or employee well-being, as well as full employment and declining psychosocial stressors, but also ethical governance and sustainable organizational performance features (the so-called Industry 5.0).

2.1. RESEARCH GAP

While the various aspects of Industry 5.0 have been addressed by some scholars from technological and manufacturing perspectives, little has been paid to synthesizing the emerging HR challenges faced due to smart workplaces. Current research is mostly piecemeal, dealing with isolated aspects such as AI adoption, employee well-being, or sustainability. There is little in the way of a comprehensive review integrating workforce transformation, ethical AI, hybrid work at scale, leadership, and the human workplace. Hence, the present study sought to bridge this gap, providing an integrated review of HR challenges and future research streams in Industry 5.0.

3. RESEARCH METHODOLOGY

In this paper, we conduct a Systematic Literature Review (SLR) for the new human resource challenges anticipated with Industry 5.0 and the smart workplace related to it. SLRs are based on a transparent, systematic, and reproducible approach to identifying, assessing, and synthesizing results from existing peer-reviewed work to provide less biased and more reliable findings. The electronic literature review was performed in major academic databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, and MDPI, since these are the potential databases that host high-quality peer-reviewed research articles related to Industry 5.0, human resource management (HRM), artificial intelligence (AI), organizational behavior, and smart manufacturing. We included studies from 2021 to 2025, ensuring the most contemporary advances in the field were covered. The search strategy used combinations of keywords and Boolean operators “AND”/“OR”, including keywords Industry 5.0, HRM 5.0, Smart Workplace, Human-Centric Organizations, Artificial Intelligence, HR Challenges, Human-Machine Collaboration, and Employee Well-being in Industry 5.0. In addition, we reviewed the reference lists of selected studies to find additional relevant publications. The articles included in the final studies were analyzed using thematic analysis to reveal overarching themes such as labor skill deficits, employee welfare, privacy and ethical concerns, human-machine collaboration, hybrid work challenges, organizational survival and transformation, and organizational sustainability. By synthesizing the themes together, this research aimed to offer an overview of how human resource management is evolving in Industry 5.0 and suggestions for future directions towards resilient, human-centric, and sustainable smart workplaces.

4. MAJOR HR CHALLENGES IN INDUSTRY 5.0 AND SMART WORKPLACES

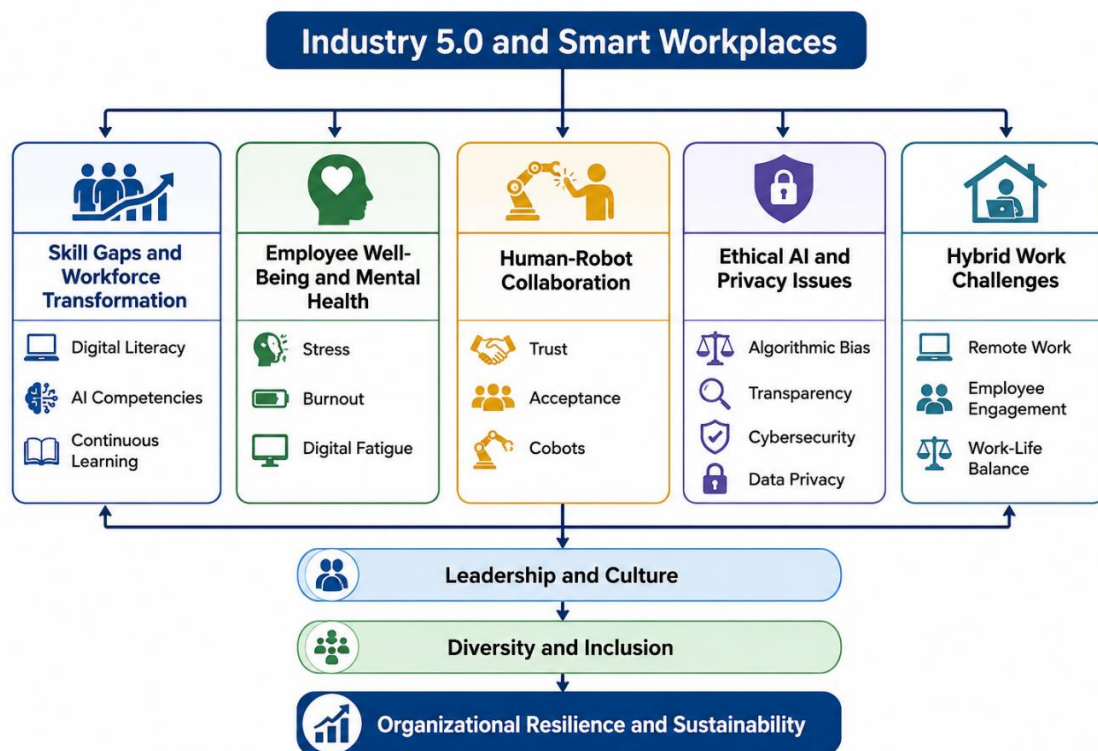


FIGURE 1 Major HR Challenges in Industry 5.0 and Smart Workplaces

The shift from Industry 4.0 to Industry 5.0 is changing traditional organizational structures and work environments based on human-centricity, sustainability, and the synergy between humans and intelligent technologies. AI-powered smart workplaces, as well as Cloud and IoT devices, collaborative robots, and big data analytics, offer new advancement opportunities for organizations in terms of productivity and innovation. Still, these developments have also given rise to a number of challenges for human resource management. HR is now on the hook to deal with technological change while also keeping employees safe, maintaining organizational viability, and ensuring ethical governance. As such, the role of HR has transitioned from just

administrative duties to a more strategic responsibility focusing on workforce development and employee engagement as well as successfully managing change. The subsequent sections delve into the actionable HR challenges that managers face in Industry 5.0 and smart workplaces.

4.1. SKILL GAPS AND WORKFORCE TRANSFORMATION

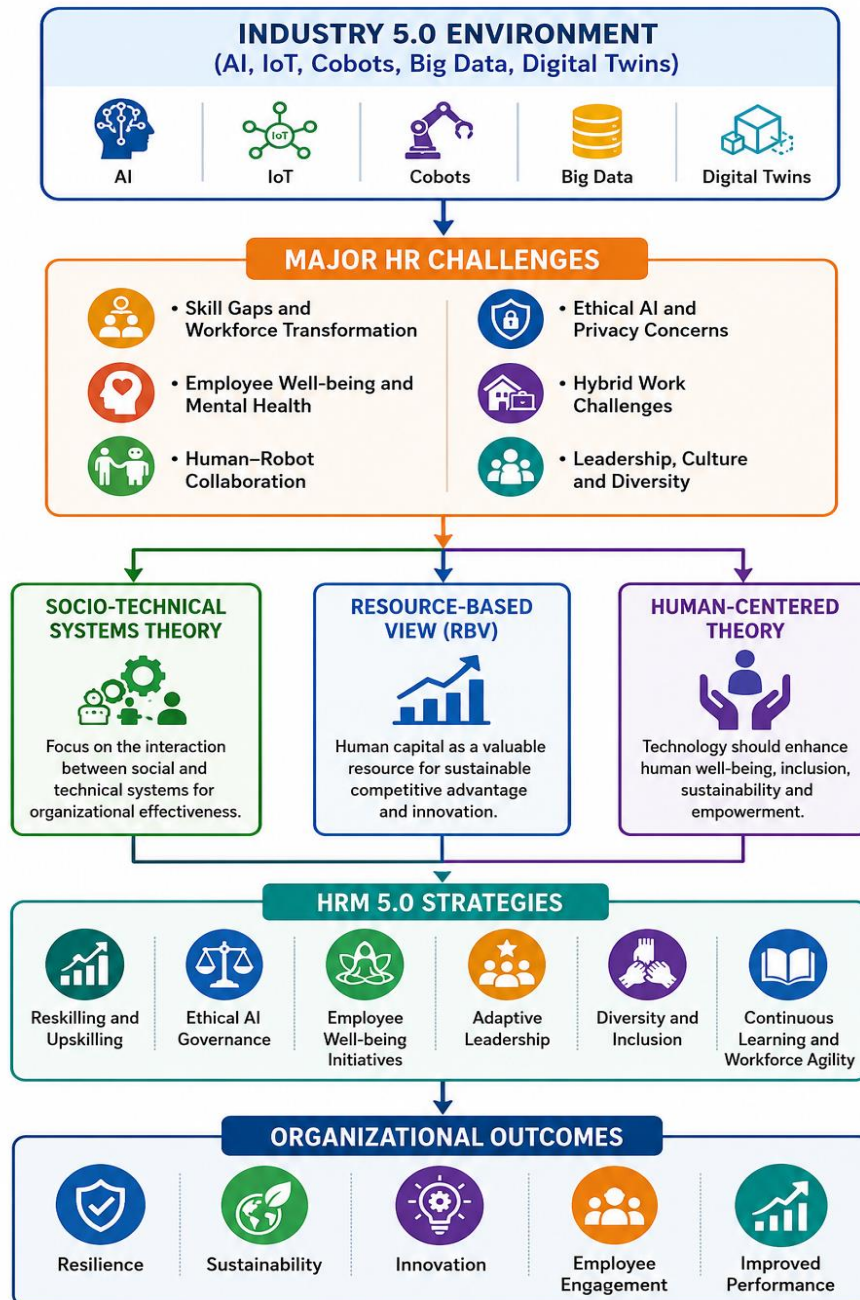


FIGURE 2 Integrated Theoretical Framework for HRM 5.0 in Smart Workplaces

Adaptation of the workforce to rapidly evolving technologies is one of the foremost challenges in Industry 5.0. Competent workplaces will depend on employees having traits such as digital literacy and analytical capability, creativity, emotional intelligence (EQ), and critical thinking skills. Gone are the days when business organisations were simply looking for technical skills and competencies; rather, the employees today need to adapt to AI-powered systems as well as intelligent machines to form a collaborative working dynamic. Organizations struggle to close the skill gaps and build future-ready workforces with reskilling and upskilling initiatives. This has made continuous learning crucial to remaining competitive and improving agility in organizations. These trends are being furthered more and more through e-learning platforms, artificial intelligence-driven training systems, and personalized learning approaches by human resource departments in adopting future-ready employees (Verma & Venkatesan, 2022; Grabowska et al., 2022; Xu et al., 2021; Longo et al.). Within the context of HRM 5.0, specifically when identifying sustainable competitive advantage based on technological capabilities and HRM outcomes

(Piwowar-Sulej, 2021; Longo et al., 2025), the importance of technology-enabled competences embedded in human skills is accentuated with creative and emotional intelligences as predominantly human characteristics.

4.2. EMPLOYEE WELL-BEING AND MENTAL HEALTH

Although many organizational factors related to well-being and psychological health have been identified in previous chapters, the rise of digital technology and intelligent work systems has had particular impacts. While smart workplaces were built to provide flexible and efficient work environments, they have also increased workplace stress, burnout, and digital fatigue.

Noise of Change: Employees are anxious about never stopping technological change, increased performance expectations, and job loss. The continued use of virtual communication platforms and ever-increasing durations in front of screens has only led to mental fatigue and impaired work-life balance. As a result, organizations are prioritizing employee welfare programs, flexible work policies, and psychological support systems to develop employee resilience and satisfaction. Industry 5.0 promotes a human-centric perspective where caring for employees is treated as equally important as productivity and technological development (Antonaci et al., 2024; European Commission, 2021; Pacheco & Iwaszczenko, 2024; Sony & Naik, 2020). According to recent studies (Longo et al., 2025), organizations that actively promote employee well-being have been shown to have increased levels of engagement, innovation, and organizational performance.

4.3. HUMAN-ROBOT COLLABORATION

Collaborative robots, which are colloquially known as cobots and are found in many a manufacturing lab today, are one of the cornerstones of Industry 5.0, the human-robot cooperation rather than replacement. As a result, collaborative robots (cobots) support employees in preparing, performing, and completing monotonous and dangerous tasks, which allow better productivity, safety, and operational efficiency. On the other hand, successful human-machine collaboration is heavily dependent on employee trust. Smart technologies are seen as competitors in jobs by many employees, which hinders their cooperation with changes in technology. HR professionals are thus the significant enablers of change management, technology-related competence, and information about the role of intelligent systems as complementary. The successful integration of humans and machines, as well as the resilience of the organization, lies in organizations that trust their employees, are transparent with them, and include them actively (Nahavandi, 2019; Pacheco & Iwaszczenko, 2024; Longo et al., 2025; Xu et al., 2021).

4.4. ETHICAL AI AND PRIVACY CONCERNS

As artificial intelligence is now widely used in recruiting, performance management, and workforce planning, the ethical issues of fairness, transparency, and privacy have become backbone essentials. To do so, you need to account for one of the many things that threaten our productivity: Algorithmic Bias — a significant issue in which an AI software inadvertently generates discriminatory results, thus influencing hiring and promotion processes. Additionally, employees are demanding more visibility about AI-based decisions that impact their working lives. Cybersecurity and the protection of personally identifiable information have also been common focus areas as businesses move toward increased reliance on digital infrastructures. The smart workplace creates massive volumes of employee data from a legion of digital platforms as well as wearable technologies, highlighting the need for data governance and privacy protection. As a result, companies need to implement ethical AI frameworks and work closely with IT departments (Vyhmeister & Castane, 2024; Dwivedi et al., 2023; Longo et al., 2025; European Commission, 2021) in order to use AI responsibly while enhancing employee trust.

4.5. HYBRID WORK CHALLENGES

Presently, hybrid work models are a mainstay of organizations across various industries, and they do bring several HR challenges. Remote and flexible work arrangements increase employee autonomy, convenience, and comfort, but it also adds elements of challenge related to communications and employee engagement. Conversely, reduced in-person interaction may erode culture and colleague cohesion. Also, the lines between business and personal life are even crossing each other while creating tension, weariness & digital exhaustion. Organizations are investing in digital collaboration tools, health and wellness initiatives, and flexible work policies to ensure that employees remain engaged and productive. New management paradigms guide organizations to effectively manage hybrid workplaces relying on innovative HR practices designed to enhance the well being of employees and the overall performance of organizations (Kniffin et al., 2021; Antonaci et al., 2024; Longo et al., 2025).

4.6. LEADERSHIP, ORGANIZATIONAL CULTURE, AND DIVERSITY

Leadership styles and organizational culture must change in order to support Industry 5.0. The hierarchical structures of the past have slowly been replaced with agile, collaboration-driven, and employee-centric systems characterized by flexibility and innovation. In fact, change management is the backbone of a successful digital transformation process. Moving to digital involves employee Enablement and participative decision-making. At the same time, diversity and inclusion have become a strategic priority as organizations around the world manage multigenerational and culturally diverse workforces. Your training lays the foundation for personalized workplaces, flexible work arrangements, and equity of opportunity to enhance employee satisfaction and innovation. Organizations can become resilient, institute sustainable growth using a supportive organization

culture built on trust, inclusiveness, and continuous learning. By consequence, HR professionals are required to build an environment that promotes diversity, collaborative work and long-term sustainable organization sustainability (Pacheco & Iwaszczenko, 2024; Grabowska et al., 2022; Antonaci et al., 2024; Longo et al., 2025.)

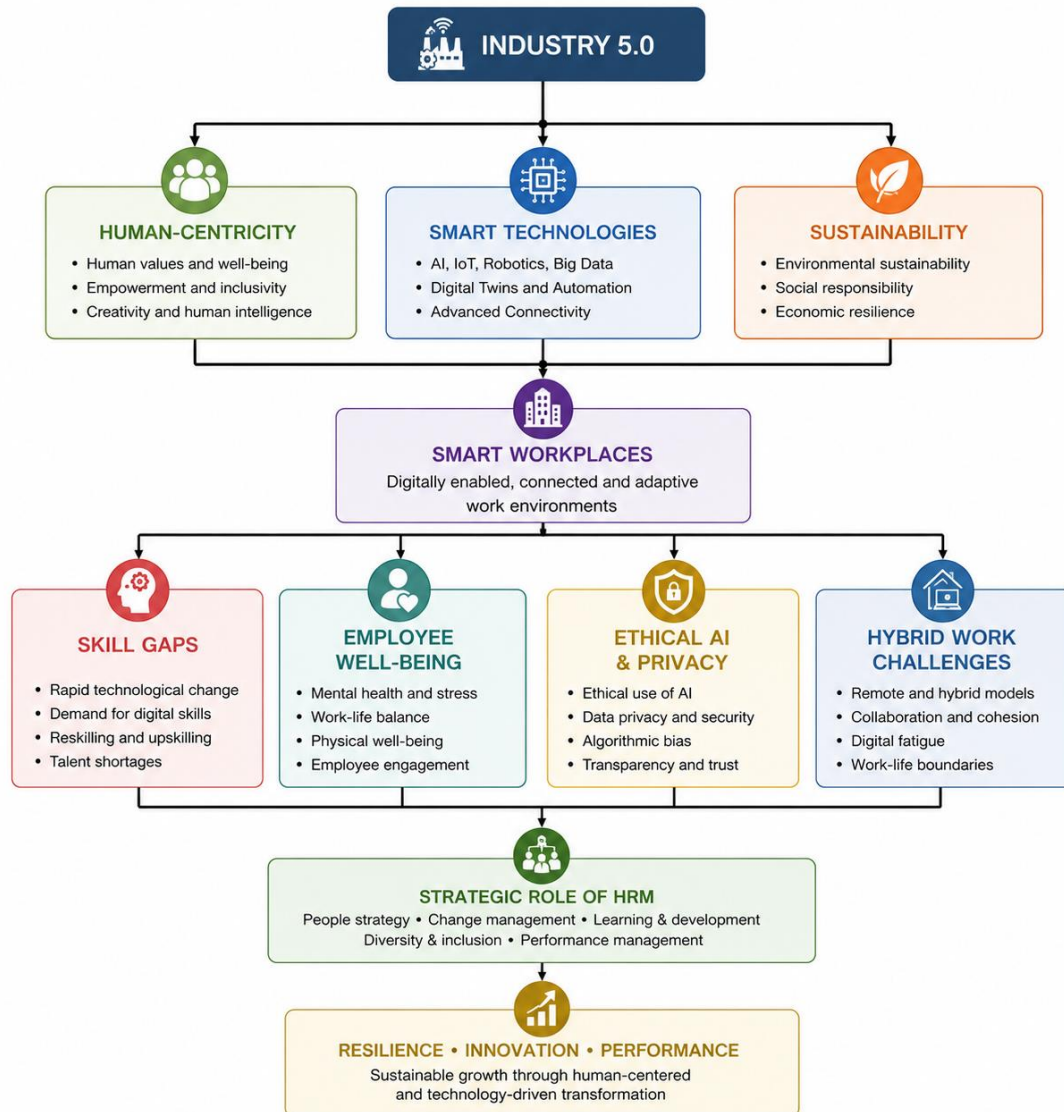


FIGURE 3 Conceptual Overview of HR Challenges in Industry 5.0

5. THEORETICAL FRAMEWORK

Theoretical frameworks offer a framework to comprehend the new challenges that confront human resource management in Industry 5.0 and smart workplaces. With organizations implementing people-factor and technology equity approaches, the human-technology-organizational resource interaction theories become more relevant. Thus, the current study is founded on Socio-Technical Systems Theory and Resource-Based View (RBV) in conjunction with Human-Centered Theory that provides insights into how organizations can succeed potentially succeed in sustainable performance by uniting efficiently technological innovation with human capabilities (Longo et al., 2023; European Commission, 2020).

5.1. SOCIO-TECHNICAL SYSTEMS THEORY

So here is where Socio-Technical Systems Theory comes into play, which reminds us how organizational effectiveness relies on a balanced interaction between social and technical systems. In Industry 5.0, these smart workplaces are about human learning and practicing along with artificial intelligence (AI) assistance in combination with collaborative robots, autonomous mobile robot vendors, as well as digital worker platforms. And, so organizational insurgence continues to be impossible without the employees having any skills at all or a modicum of trust, communication, and sense of culture (Xu et al., 2021). This theory provides HR with a consideration for developing employee capabilities to ensure effective human-machine collaboration and increase organizational resilience through the creation of supportive work environments (Pacheco & Iwaszczenko, 2024)

5.2. RESOURCE-BASED VIEW (RBV)

Human resources are seen as a strategic asset to sustainable competitive advantage in the Resource-Based View (RBV). Technologies such as virtual and augmented reality, artificial intelligence, drones (Unmanned Aerial Vehicles (UAV)), 3D printing, robotics, unable to cope with Industry 4.0 challenges, have become the basis of Industry 5.0, where digital competencies, creativity, adaptability, and emotionally intelligent human resources have become key problems for innovation capacity improvement and organizational success in the long run. As a result, organizations must invest in continuous learning, talent development, and knowledge management to augment human capital (Longo et al., 2025). The theory states that organizational competitiveness depends on what the employees know and what they can do, even in an age of increasing reliance upon technology (Verma & Venkatesan, 2022).

5.3. HUMAN-CENTERED THEORY

Human-Centered Theory is the connotative framework for Industry 5.0, which claims technology should augment human capabilities rather than replace them. The theory promotes employee well-being, inclusiveness, and sustainability as important factors of organizational success with a focus on empowerment among employees. It considers employees as active contributors to innovation and encourages organizations to build workplaces that foster psychological safety, work-life balance, diversity, and continuous learning (European Commission, 2021). From a human resource management perspective, the theory emphasizes ethical governance, supportive leadership, and personalized work environments as key factors that help create resilient and sustainable smart workplaces (Antonaci et al., 2024; Longo et al., 2025).

Taken together, these theories offer a robust foundation for addressing HR challenges in Industry 5.0. The Socio-Technical Systems Theory explains the interaction between personnel and technology, while the Resource-Based View conveys the strategic importance of human capital; henceforward, Human-Centered Theory focuses on personnel well-being and sustainability. Across the above perspectives, they equip practitioners to build smart and resilient workplaces that are inclusive and human-centric (Xu et al., 2021; Longo et al., 2025).

6. FUTURE RESEARCH DIRECTIONS

Industry 5.0 opens new possibilities for research within the topics of smart workplaces and HRM. Prior research has mainly addressed operational issues connected with technological advancement and digital transformation, but more attention is needed on the human side of Industry 5.0 (Xu et al., 2021; European Commission, 2021). Future research also has to provide fertile ground for more comprehensive frameworks for HRM 5.0, which includes artificial intelligence, machine learning, predictive analytics, and digital technologies in recruitment, training, performance management, and talent development. Future empirical studies are required to explore how firms can mitigate the employee impact of automation by employing human creativity, emotional intelligence, and employees' well-being alongside improved organizational performance (Longo et al., 2025).

An additional possible avenue for this research is Green Human Resource Management (Green HRM) and its influence on sustainability and responsibility activities. Sustainability is among the pillars of Industry 5.0, so it will be worthwhile for researchers to investigate how green recruitment, eco-friendly training practices, sustainable performance management, and environmentally responsible employee behavior can have an impact on organizational competitiveness and long-term performance (Grabowska et al., 2022). Besides, follow-up studies are needed to unveil guidelines for organizations on how they can combine sustainability initiatives and digital transformation strategies to navigate towards resilient and sustainable workplaces.

Also, with the adoption of artificial intelligence in smart workplaces, research on trustworthy AI and ethical governance is gaining growing significance. As algorithmic bias, transparency, explainable AI, cybersecurity, and data privacy concerns have taken root in the workplace (Vyhmeister & Castane, 2024), ethical leadership has emerged as an important new area of study. Future research should examine predictors of employee trust in AI-enabled systems and governance approaches for fair, accountable, and responsible AI integration. Also, key questions revolve around sustainable leadership and organisational resilience how do leaders face up to the digital transformation challenges and enhance employee engagement and innovation (Pacheco & Iwaszczenko, 2024).

Finally, a last suggestion for future research should be to focus on human-centered workplaces, the core of Industry 5.0. Scholars will examine how flexible work arrangements, diversity and inclusion, employee empowerment or delegation of authority, human-machine collaboration, and organizational culture help to foster a greater sense of well-being and psychological safety among employees (Antonaci et al., 2024). Second, interdisciplinary studies drawing from human resource management, organizational behavior, psychology, information technology, and sustainability would help shape integrated frameworks to implement technological progress in ways that align with the values of humanity. This research will play a critical role in developing resilient, inclusive, and sustainable smart workplaces that can be net long-term sources of psycho organisational excellence (Longo et al., 2025; European Commission, 2021).

7. MANAGERIAL IMPLICATIONS

The results of the current study present a number of practical comments for human resource managers, organizations, and policy makers in the midst of the Industry 5.0 context and smart workplace. Considering that organizations are using advanced technologies in tandem with employees, it is important to find strategies that support innovation, sustainability, and well-being (European Commission, 2021; Longo et al., 2025). With the ongoing trends, human resource managers are expected to evolve from administrative tasks to strategic roles by focusing on continuous reskilling and upskilling, fostering lifelong learning, and building agile workforce practices that support employee adaptability and digital skills (Verma & Venkatesan, 2022; Longo et al., 2025). Moreover, they should orient both efforts toward employee well-being initiatives that can help mitigate stress, burnout, and digital fatigue as well as support ethical artificial intelligence, transparent communication, and inclusive workplace policies to reinforce ways to gain employee trust and engagement (Antonaci et al., 2024; Vyhmeister & Castane, 2024). On the organizational level, businesses must develop human-centric cultures to integrate technology in parallel with employee welfare and sustainability goals (Nahavandi, 2019; Grabowska et al., 2022). Investments in artificial intelligence, digital infrastructure, and collaborative technologies must go hand-in-hand with investments in employee development, organizational learning, cybersecurity, and flexible working arrangements (Mourtzis et al 2022; Longo et al 2023). In addition, organizations have to foster diversity and inclusion, delegate decision-making responsibility for empowerment, and build leadership capabilities that provide resilience and sustainable competitive advantage (Pacheco & Iwaszchenko, 2024). On a policy level, transformational change can be facilitated by governments and regulatory institutions through policies that promote digital literacy, skill development, and lifelong learning (European Commission 2021). The technology must become more ethical and transparent through stronger regulation of AI, cybersecurity, etc. (Vyhmeister & Castane, 2024). Moreover, government, industry, and academia collaboration may facilitate innovation as well as a skilled workforce and sustainable economic growth (Longo et al., 2025; Grabowska et al., 2022). Hence, managing Industry 5.0 effectively necessitated a collaborative effort by HR professionals and organizations with policymakers to build resilient, inclusive, human-centric workplaces that can sustain sustainable growth and competence (Xu et al., 2021; Longo et al., 2025).

8. CONCLUSION

Industry 5.0 marks a significant transformation in human resource management by shifting organizational priorities from technology-driven efficiency toward human-centric, resilient, and sustainable workplaces. The findings of this systematic literature review reveal that HR professionals are confronted with multifaceted challenges related to workforce transformation, skill development, employee well-being, human–robot collaboration, ethical artificial intelligence, hybrid work arrangements, leadership transformation, and diversity management. Addressing these challenges requires organizations to adopt continuous learning systems, employee-centric practices, ethical governance mechanisms, and adaptive leadership approaches capable of balancing technological advancement with human values.

From a theoretical perspective, this study contributes to the emerging HRM 5.0 literature by integrating Socio-Technical Systems Theory, Resource-Based View (RBV), and Human-Centered Theory to provide a comprehensive framework for understanding the interaction between technological innovation, organizational capabilities, and employee well-being in smart workplaces. The study demonstrates that sustainable organizational performance depends not only on advanced technologies but also on the effective alignment of human resources and organizational culture.

Practically, the findings provide valuable insights for HR managers and organizational leaders by emphasizing the importance of reskilling and upskilling, employee empowerment, ethical AI adoption, inclusive workplace cultures, and sustainable leadership practices. Furthermore, the study highlights the critical role of policymakers in establishing regulatory frameworks that promote digital literacy, responsible AI governance, cybersecurity, and workforce sustainability. Overall, the success of Industry 5.0 will depend on the ability of organizations to create resilient, innovative, and human-centric ecosystems where technology complements rather than replaces human capabilities. Consequently, HRM 5.0 should be viewed as a strategic enabler of sustainable organizational excellence and long-term socio-economic development in the era of intelligent and smart workplaces.

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